ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

Vol. XC, No. 26 — PAPER — Thursday, June 26, 1930

To Build $1,500,000 Addition At Cloquet

Work Is To Start At Once On Expansion of Northwest Paper Co. Plant Which Among Other Improvements Will Include the Installation of An Additional Paper Machine To Be Furnished By the Beloit Iron Works of Beloit, Wis.—Directors Also Authorize Construction of Another Nu-Wood Plant

CLOQUET, Minn., June 23, 1930.—Work on the $1,500,000 addition to the Northwest Paper Company's plant at Cloquet will be started at once, it has been announced by H. C. Hornby, president. The contract was awarded to the James Leck company of Minneapolis.

To Be in Operation in 1931

The plans for an expansion program were made public about a year ago by Mr. Hornby, who indicated that the new additions and machinery would be in operation by the spring of 1931.

Recently the company completed negotiations for the purchase of timber over a ten-year period and several weeks ago awarded the contract to the Beloit Iron Works of Beloit, Wis., for a paper machine to cost $250,000.

A substantial payroll increase is also forecast by Mr. Hornby when the plant begins operating next spring. The output of the company will be increased approximately seventy tons a day.

Another Nu-Wood Plant at Longview

Directors of the company have also authorized the construction of another Nu-Wood plant at Longview, Wash., Mr. Hornby said. Inability to secure enough raw material here made it necessary to operate on the West Coast, it was explained.

Dismantle Union Bag Mill No. 5

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., June 23, 1930.—The completion of the task of dismantling Mill No. 5 of the Union Bag and Paper Corporation was completed this week and as the concern has no immediate plans for its use it is understood that it will be placed on the market. All machinery has been removed, the sprinkler system disconnected, and the services of the few remaining workers dispensed with.

The other units of the firm are operating near capacity and the outlook for the remainder of the year is reported very good. An average of about six carloads of bags are being shipped daily and it is understood that a number of large contracts are assured which will require additional workers. It was also announced that all differences and difficulties between the Papermakers' Union and the corporation had been satisfactorily settled and that the agreement would probably be signed next week.

Announcement is also made of the resignation of William Hanna, who has served as assistent superintendent for many years. He was in charge of Mill No. 5 until operations were suspended a few months ago and since then he has been employed at the Fenimore plant. Prior to coming here he was superintendent of the branch mill at Cheboygan. He has not announced his future plans.

Russian Pulp Wood For International

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., June 23, 1930.—The first ocean liner with a cargo of pulpwood for the Port of Albany sailed from Archangel, Russia, this week and is expected to reach here soon. In about two weeks the vessel will land in New York harbor where the cargo will be transferred to barges for delivery here. It is understood that the channel in the Deeper Hudson has not yet been sufficiently widened to permit the passage of the huge vessel.

The shipment is for the mills of the International Paper Company in Northern New York and it was recently announced that over 250,000 tons would be transported from Russia into the local terminal. Movement of this tonnage will continue during the remainder of the year and over 10,000 freight cars will be used in the final journey to Corinth, Fort Edward and Glens Falls. As soon as the Deeper Hudson channel is completed to its full draft late this year it is expected that the ships will make the passage direct from Archangel to the docks at the Port of Albany.

Information given out here revealed that two other ships are now being loaded in Russia while eighteen other vessels are also under charter for transportation purposes. The completion of the Hudson channel for full ocean draft navigation is scheduled early in the Fall and the Port Commission is now making plans to care for the increased movement of tonnage sure to follow.

The First Sheet of Paper Made in Kalamazoo

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., June 23, 1930.—The first sheet of paper manufactured in Kalamazoo was produced at the mill of the Kalamazoo Paper Company, December 14, 1867. A portion of that sheet, suitably framed and inscribed, now hangs in the office of Jacob Kindleberger, president of the Kalamazoo Vegetable Parchment Company. It was willed to him by the late Mrs. Allen Potter, widow of Allen Potter, who was one of the funders of Kalamazoo Paper Company and a financial power in Kalamazoo in the 60s and 70s.

Paper Demand Rather Spotty In Philadelphia

Request For Various Standard Grades of Paper At Minimum For Season, With Exception of Usual Active Summer Lines—Due Mainly to Prevailing Steadier Price Trend, Outlook For Future Is Considered More Encouraging Than of Late, In Some Quarters

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 23, 1930.—There is a decidedly quieter tone to the paper market as the summer vacation season approaches and with the exception of the seasonally active grades the demand is at a minimum for the current season. Despite this hazy character to the present business trend the trade has been convinced that prices are bound to improve rather than to recede further and that the bottom has been reached with the firmer tone noted in the past fortnight and the absence of mill offerings that would hold over into the coming month. The paper trade is more confident that the turn in the kraft market has taken place for the betterment of the industry generally and that from now on krafts will gradually advance, the first step in that direction having taken place this month with the rise of $5 per ton on deliveries for the coming month. While the mills in the south have given local large customers the advantage of June deliveries on the old schedule, the July kraft shipments from below the Mason and Dixon Line will be at the rising schedule. In line with the rise in the price of krafts, bags have been similarly advanced. Fine paper trading is spotty. The wholesalers and mill representatives report slightly less activity in the volume consumption of printers and publishers who buy under contract although the outlook for renewal of contracts for the next quarter and for the term of the remainder of the six months of the year are encouraging, as these heavy consumers are looking forward to advances in the Fall.

While cotton twines have been showing signs of stabilization at the present lower levels, which are the rock bottom for the year, there is looked for an advance in the prices on jute content cords that will be affected by tariff revision and through the situation now existing in India as a result of the Ghandi uprising. Jute twines are firmer and the local manufacturers and dealers in hemp products expect the prices by Fall will be higher when the short new hemp crop will be reflected in prices along with the tariff rise. Supplies of jute twines in the hands of dealers are low so that an advance may be expected before the summer months have passed.

Paper Distributors at Strathmore Sales Convention

Members of the Philadelphia distributive firms of Strathmore Papers journeyed to the annual sales convention of the Strathmore Paper Company, held last week at the mills in Mittineague, Mass., where a social program and outing was interspersed with the business sessions. Those from the Quaker City trade who joined in the convention activities were Norbert A. Considine of the Paper House of Pennsylvania and Paul Klang of the sales staff of that concern; Leon Beck, Andrew Simon, and the salesmen, G. P. Johnson and C. W. Bond, of the Charles Beck Company; Leonard Raymond and Lawrence A. Gipp of Raymond and McNutt and A. Richard Hartung, of A. Hartung, Inc. The local representatives remained in the New England territory for the week, visiting other mills before the homeward trip.

Paper Trade Associates at Franklin Memorial Dedication

Members of the Philadelphia Paper Trade Association who are active in the erection of the memorial which is to be erected to the memory of Benjamin Franklin and which will involve the sum of $5,000,000 for the building alone, joined in the big celebration held last Wednesday when the ground was broken for the Benjamin Franklin Memorial on the site selected for it at Logan Circle on the Parkway. Those from the Philadelphia paper trade who were seated at the table at the Victory Luncheon in the Benjamin Franklin Hotel, with the donators to the fund, were: Norbert A. Considine, of the Paper House of Pennsylvania; Simon Walter, S. Walter, Inc.; George W. Ward, D. L. Ward Paper Company, and Howard Satterthwaite, Satterthwaite-Cobaugh Company.

The Victory Luncheon terminated the drive but the organization of the paper industry for the erection of a permanent paper exhibit with full equipment of a mill in modern mechanical displays and with full data on paper manufacture visualized in the exhibits of the American paper making industry to be erected in the Benjamin Franklin Memorial Building will be carried on in the next few weeks so as to provide for the erection of the paper industrial exhibit before the year is out, along with other American industrial displays that will be featured. It is to erect a fitting exhibit to the paper industry in line with the elaborate Graphic Arts Exhibit which will be featured as part of the important Benjamin Franklin Memorial on the ground floor that the workers in the paper trade are directing their attention and a full participation of the paper industry in the United States is sought in a nationwide drive for the project of erecting a worthy paper exhibit in line with its importance in general industry of the country and on a parity with the exhibits of other industrial enterprises which will become permanent displays in the Memorial. Thomas F. Fort, Jr., head of the Thomas W. Price Company, 506 Ludlow street, subscribed to the Franklin Memorial and his donation of $5,000 was announced at the Victory Luncheon.

Paper Industry to Form Advisory Committee

With the drive to erect and maintain a suitable memorial to Benjamin Franklin in Philadelphia, successfully closed, and the great institution to be located in the heart of Philadelphia becoming an accomplished fact, leaders in the industry have been asked by the Franklin Institute to take steps to prepare a suitable exhibit of pulp and paper making, and its application to industry, for the edifice when completed. The Committee consists of Norbert A. Considine, of The Paper House of Pennsylvania, and a Director of the Poor Richard Club, which conceived the project, Chairman; George W. Ward, of D. L. Ward Company, and Grellet Collins, of Dill & Collins Company. Leaders in the industry, particularly manufacturers of national reputation, have been approached within the past week by the committee. The reaction to the proposal has been very favorable, and steps are now being taken to form an advisory committee to work with the Franklin Institute in defining the scope of the exhibit.

"The Living Memorial" as it is termed, is to house working models showing the progress and present development of science in its application to Industry. It will show Electricity, Light, Heat, Sound. The Chemical Industries, Transportation, including Aviation, the Telephone, Textiles, and Engineering in all its phases. One of the leading exhibits will cover the Graphic Arts—the history and development of printing, with a complete demonstration of modern processes and equipment. The general idea of the Paper Exhibit is to show the history of Paper Making, and contrast the technical developments of today, and the wide uses of Paper and Paper Products with the primitive processes of former times. The General Public will be familiarized with the wide variety of papers for industrial and hygienic uses, for educational and communication purposes. The marvels of present day pulp and paper making, the raw materials employed and the extent and scope of the industry.

For the youth of America, it is believed the Museum will exert a profound effect in selecting vocations. A proper paper and pulp exhibit will undoubtedly inspire many ambitious youths to choose pulp and paper making as an interesting vocation in life and will

enable the sons of those now engaged in the industry to visualize the ramifications of the business, and to approach the career their fathers have selected with a broad knowledge of the fundamentals of the business, heretofore achieved only by long study of information from widely scattered sources. The library and resources of the Franklin Institute, America's foremost Scientific Society, will be thrown open to the Technical Associations of the Paper Industry, through which, contact may be established with scientists and research men in other fields. The platform of the Lecture Hall of The Franklin Institute commands the attention of an international public. The pulp and paper industry could have no better medium for conveying to the public the story of the technical progress of the Industry. The possibilities for the Industry are so vast that although it will be many months before the building, for which ground was broken on June 18, is completed, those leaders in the industry who have given thought to the subject, believe that too much care and forethought cannot be extended in preparing a display which conservative estimates predict will attract some seven millions of visitors annually.

Grellet Collins Ill

Grellet Collins, head of the Dill & Collins Company, manufacturers of fine papers, was stricken with a carbuncle on the back of the neck during the week and was unable to attend the Victory Luncheon given by the Benjamin Franklin Memorial at the Benjamin Franklin Hotel, as a member of the committee directing the paper trade exhibit. On the orders of his physician he has been barred from activities in the business and is now sojourning in New England recuperating from the ailment.

Ad-Tissue Plant Destroyed by Fire

The plant of the Ad-Tissue Corporation, at Stanton, Del., with its entire stock was destroyed by fire last Thursday. The fire of undetermined origin badly damaged the interior of the building and wiped out the entire stock of finished products causing a loss of $225,000.

Paper Trade Association Concerned with Credits

When the fine paper dealers of the Philadelphia Paper Trade Association met at the Down Town Club last Wednesday there was presented to the members the problem of credits and the composite cost figures which were based upon the costs schedule of all members of the group and along the lines of the Standard Cost System of the National Association. The Credit Bureau reported definite uniform sales terms and credit adopted and those who are not members of the Credit Interchange group were invited to a special meeting to be held this Monday at the office of the Philadelphia Association of Credit Men, whose members have approved the uniform terms of the Credit Bureau. The officers of the Philadelphia Typothetae have also expressed approval of the uniform system.

Wholesale Waste Merchants Set Date for Outing

Members of the Wholesale Waste Merchants Association of Philadelphia, comprising the paper stock and rag dealers of the Quaker City, will hold their annual outing on July 10 at Kugler Mohican Club, Morris On The Delaware River, just 10 miles on the Jersey shore from Philadelphia. There will be a motor trip along the Delaware River banks to the site, and on the spacious grounds of the famous resort will be staged many sports which will bring contestants for the numerous prizes that will be awarded in the program of the afternoon and evening. The most lively contested event of these yearly gatherings is the baseball game between the Paper Stock and the Rag Merchants, and this year strong teams of trade talent will be lined up on both sides. There will be a noon luncheon and an elaborate evening dinner while the afternoon will be given over to other sports such as golfing, tennis, swimming contests and many fun provoking novelty games that always bring an enthusiastic entertainment to onlookers and participants. The committee in charge of the arrangements is made up of the following members: William J. McGarity, Jr., Penn Paper and Stock Company, and secretary of the association; Charles J. McNichol, of P. DiSanti & Co., and Thomas A. Kenny, President of the association and of the International Trading Company. The outing will include entertainment for the entire trade associates in the various branches of the waste industry, including the paper stock, rag dealers, and the allied metal, rubber, woolen and cotton waste wholesalers.

J. L. N. Smythe Co.'s Picnic

Members of the firm and associates on the staff of the J. L. N. Smythe Company, 30 South 6th street, joined in the annual outing held this year at Knights Park, Collingswood, N. J., with thirty picnicers enjoying the program of outdoor entertainment provided for the mid-June festivity. Those from the firm who participated in the outing last Saturday were T. H. B. Smythe, head of the company, and his associate in the business, Vice President and Secretary H. Elmore Platt. The outstanding of the sporting events of the day was the contest on the diamond between two teams made of the staff workers who were titled the Sisal Krafters, with George H. Beck, captain, and the Green Corers, with J. H. Lappan as captain of the nine. The baseball players were grouped according to products which they represent in the company's list of papers, the Sisal Krafts and the Green Core gummed papers—the Green Corers winning by 14 to 9. Following the picnic luncheon and the evening dinner there were games and sports for both ladies and the men members. An honored guest at the picnic was A. M. Anderson, vice president of the Sisal Kraft Company, Chicago, who journeyed here to join in the frolic. Irving McHenry, of the Mid-States Gummed Paper Company, Chicago, intended to be present but was detained at his desk because of business engagements but sent his regrets and good wishes to the firm, and these were extended by President Smythe in his word of greeting to the staff.

Elias Magil Wins College Honors

Young Elias Magil, son of Myer Magil, head of the Penn Card and Paper Company, 20 North 6th street, who matriculated from the University of Pennsylvania last week, was among the scholars in the law graduates who were distinguished by honors conferred because of their excellent records in studies. The young man, who is just 23 years of age, was given the Gowen scholarship for research in law which carries a $2,000 annual allowance for the advanced course in legal research work. He was distinguished by election to the presidency of his class and was also honored with the presidency of the Sulzberger Law Club. He will take up the course in law research in the coming year and will also enter the legal profession, beginning his practice as soon as admitted to the Bar this year.

Allen E. Whiting Embarks for Hawaii

President Allen E. Whiting, of the Whiting Patterson Company, 320 North 13th street, sailed from New York last week for a prolonged stay and cruise in the Pacific, making his stopping place for the summer months in the Hawaiian Islands. He will return to his desk by Labor Day.

Hydro-Electric Project at Hudson Falls

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., June 23, 1930.—Indications that a huge hydro-electric power project is being planned by the Niagara-Hudson Power Corporation was seen this week when a survey of the river between this village and Fenimore was started. When the firm purchased the water rights and three hydro-electric stations owned by the Union Bag and Paper Corporation here a few weeks ago it was announced that no immediate development was planned despite rumors to the contrary. While the survey is being made primarily to give the company correct measurements of its newly acquired property it is believed that it may have some bearing on a new power development project.

Ontario Paper Manufacturers Fairly Active

Majority of Fine Paper Mills Are Registering Gratifying Tonnages—Specialty Group Is Particularly Busy At Present—Tissue Paper Plants Have Good Volume of Business Booked Ahead—Wholesale Paper Market Somewhat Spotty In Toronto

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 23, 1930.—While business in wholesale paper lines in Toronto is still somewhat spotty most of the houses report steadily improving conditions and despite the fact that the holiday season is on, a fair amount of small order business is being booked. This is not coming easy, however, for the testimony of most wholesale paper firms is that it requires the utmost in sales efforts these days to make a good showing from month to month. It would seem, however, that June so far has shown a greater volume of sales than during May, particularly in the fine paper section, although coarse paper orders have been rather small in volume. Wrappings and paper bags are rather quiet and promise a slower return to normal selling than fine paper lines. There is quite a fair demand for writings, ledgers and bonds of all kinds and the coated paper mills are placing some good direct orders with big catalog and publishing houses, in addition to added business with the paper merchants.

There is a satisfactory degree of activity in paper manufacturing circles, with most of the fine paper mills, and those in the specialty group, registering gratifying tonnages. Included in the latter are light weight specialty mills making toilets, tissue towels, napkins and similar lines. Tissue paper mills generally are quite busy and have some nice business booked ahead. Business is none too good with manufacturers of glassine, greaseproof and waxing papers and machines are pretty well caught up to orders on hand. The same may be said of manufactured stationery lines and the paper converting trade generally, which has been rather dull for some months. The board mills are none too busy and at the annual meeting in Quebec this week of the Canadian Paper Box Manufacturers' Association the general testimony was that while business was dull at the moment there was no reason to feel depressed over the outlook which promised good business by Fall. The rag and paper market is holding steady and collections and sales to paper mills are gradually increasing.

Dean Howe on Forest Fire Situation

Discussing the forest fire situation in Northern Ontario, in which many square miles of pulpwood have been destroyed this season already, C. D. Howe, dean of Faculty of Forestry in the University of Toronto, said a few days ago: "There is an area in Northwestern Ontario extending from Lake of the Woods to Lake Nipigon, in extent of some 250 miles east and west and some 150 miles north and south that is very distinctly troublesome. It is so by reason of the fact that it is often dry there when it is not dry in other parts of the province. Climatic conditions require to be studied by the meteorological authorities. Indeed, this is being done by the Weather Bureau, which is establishing sub-stations all through the forests. The primary trouble with the area in question, and, in particular this year, is climatic. When the snow went away this spring it did not melt gradually, and thus work its way into the soil, but evaporated. It may be added, moreover, that the rainfall this season was less than usual. It must be borne in mind, too, that the population in this area is relatively sparce, with many transients roaming about. Then there is a large amount of pulpwood operations on private lands taking place at the head of the lakes which is the great center for the export of pulpwood from private lands in this province, with the consequence that there are enormous accumulations of slash. A great deal has been done to compel the settlers to burn their slash but there is still great need for improvement in this direction with respect to woods operations in the bush. The problems of slash disposal is, indeed, one of the main problems in forestry work and it is not an easy problem to solve satisfactorily. When slash disposal expenditure is necessary to protect commercial timber the operator should, in fairness, be called upon to pay towards this. But when it is necessary to protect young growth then the owner of the land should bear the cost. Ninety per cent of all forest fires are due to human carelessness in one form or another and for much of this the casual traveller is to blame."

Research Saves on Paper Bill

The Toronto Typothetae went on record at its annual meeting in the Prince George Hotel this week as favoring the establishment of a printing section as part of the Research Foundation of Ontario and it is likely that an expenditure of about $10,000 annually will be sanctioned after the special committee further investigates the proposition. A number of paper merchants were present at the meeting and the representative of one big publishing house declared that his firm had been enabled to save a large amount of money annually by applying scientific research to paper using problems. Leonard T. Acton, one of the executives of the Acton Publishing Company, Toronto, was elected president of the Typothetae for the ensuing term.

Pulp Restrictions Cause Furore

According to word from Halifax the bill introduced by the provincial premier of Nova Scotia in the last hours of the Legislature, which would restrict the exportation of Nova Scotia pulpwood by American interests, has created a furore such as has not been aroused by any measure hitherto introduced into the Nova Scotia Legislature. The bill, an amendment to the Land Tax Act, would restrict the cutting of pulpwood for export on holdings of more than 1,000 acres. So great has been the indignation aroused by its content that the Government has been obliged to stage a public hearing, at which meeting the measure was vigorously assailed by representative citizens. Colonel Thomas Cantley, Member of Parliament for Pictou County and a strong supporter of the Rhodes Government, led the ranks of insurgents from within the party. Denouncing the bill as a most iniquitous measure and an outrageous infringement of private property rights, Colonel Cantley said: "It confiscates property, call it by any name you like, and the people will not stand for it." Hector McInnes, representing the Hollingsworth & Whitney interests, said his clients had paid $4,000,000 for their property and spent about $500,000 yearly on the lands. Their attitude, he said, was to conserve their property and they would favor any measure of conservation. "This bill has been a surprise," said Mr. McInnes, "not only to Hollingsworth & Whitney, but also to the Sonora Lumber Company and to every small owner in the province. Operators in Nova Scotia rely on the banks for their financing. With this bill on the statute books the banks would not advance one dollar." Numerous other speakers advanced similar arguments contending that the proposed legislation would paralyse the pulpwood industry. It is felt that the pressure of public opinion will compel the Government to withdraw the bill.

Paper Merchants Play Golf

Paper merchants from Montreal and Toronto included in the membership of the Canadian Paper Trade Association and in the Canadian Pulp and Paper Association, met at the Royal York Golf Club in Toronto last week and mill men and merchants, the latter being the hosts, battled for the Lincoln Paper Mills trophy which

again went to the merchants. It was a good day for the annual event and there were some close individual contests as well as a fairly close running between the two groups for the main prize. This was presented at dinner following the tournament by Norman Brown, of Brown Bros., Ltd., Toronto. L. P. Turgeon, of Montreal, was toastmaster at the dinner and he proposed the toast to the mills which was responded to by John F. Taylor, of the E. B. Eddy Company. About fifty players participated in the contest. A brief business meeting of the paper merchants was held in the morning and the golf games took place in the afternoon and evening.

Alliance Paper Employees Hold Banquet

Over one hundred employees of the Alliance Paper Mills, Merritton, Ont., and their friends gathered at the annual banquet staged by the company at the town hall in Merritton, a few days ago and enjoyed a thoroughly entertaining three hours. The gathering was presided over by George W. Pauline, managing director of Alliance Paper Mills and he was supported by L. E. Fleck, assistant managing director, and C. N. Candee, manager of the Merritton Division, while the mill superintendents also occupied seats at the head table. The feature of the evening was the presentation of the shields and cups to the winning bowling teams of Alliance's inter-departmental league which is now in its fourth year. Mr. Fleck presented the girls' cups to the Beavers, the winning girls' team, while Mr. Candee presented the Lybster No. 1 team with the men's cups. During the proceedings the summer sporting activities of the Alliance people came up for discussion. This year the Alliance employees are sponsoring the Merritton senior league which includes St. Catharines, Merritton, Niagara Falls and Port Colborne in its sphere of operations. Joseph Gillis, boss finisher of the Lybster mills, is managing the Merritton team and has started out auspiciously by trimming the Falls team 9 to 5. The Alliance football team, which has won the St. Catharines and District football league premiership for the two past years, is, it was reported, looking forward to a very successful season under President Watson and Manager Cross. The quoit team, also, which holds an enviable record, is expected to live up to its reputation under Harry West and Bill Freeman.

Notes and Jottings of the Trade

George Carruthers, head of the Interlake Tissue Mills at Thorold, Ont., and Mrs. Carruthers, have left on a two months trip to the British Isles and the Continent, sailing from Montreal. This is Mr. Carruthers' first holiday in years and his first visit to the Old Land.

A cafeteria operated by the company has been opened in the basement of the head office in Toronto of the Abitibi Power and Paper Company.

Col. C. H. L. Jones, president of the Mersey Paper Company, Liverpool, N. S., was in Toronto recently and said that the company is producing in excess of capacity of 250 tons of news print daily. A record was made lately when the mill turned out 279 tons in 24 hours. Mr. Jones added that the company was looking forward to an output of 300 tons in a day in the near future. The recent forest fire which swept Queen's County, N. S., did a great deal of damage and caused heavy loss to the interests affected. Fortunately, however, the holdings of the Mersey Paper Company escaped.

The recent wage dispute between the paper makers' union of Fort William, Ont., and the Great Lakes Paper Company has been satisfactorily settled. About 2,000 men in Fort William, Fort Frances, Kenora and International Falls were affected.

Word has been received in Ontario that the famed legal action which was tried in the Ontario Supreme Court before three judges of a Divisional Court some months ago, concerning certain payments from a group of paper manufacturers to an individual company, and was appealed to the Privy Council by the complainant, has been argued before that body in England and the decision reserved.

Wilson Ney, Charles Shaw and Douglas Kipp have been transferred from the Gatineau Paper Mill of the International Paper Company to the fiber board mill at Midland, Ont.

T. J. Mullen, who has been connected with the pulp and paper industry in Canada for many years, and lately left the Canada Power and Paper Corporation, is now manager of the Eastern district for the English Electric Company, Ltd.

The Howard Smith Paper Mills, Ltd., has sent to its friends and clients in Ontario and throughout the Dominion a spring portfolio of "Ideas in Print," consisting of ten fine examples of printed pieces, which are taken from actual usage as being suggestive of what can be done by the intelligent use of the various cover stocks made by the Smith mills which lend themselves to the idea of creative printing.

C. E. French, of the Toronto office of the Howard Smith Paper Mills, was a busy man during Shriners' week in Toronto. As one of the band aides he looked after the movements and the welfare of Zenobia Temple of Toledo Ohio, under Walter Murdock, of the Strathmore Press, a Noble of Remeses Temple, Toronto.

The many friends of T. H. Allen, vice-president of Paper Sales, Ltd., Toronto, sympathized with him recently in the death of his sister, Mrs. Blair Johnson, of Saskatoon, Sask. Deceased was a prominent member of the Press Club of Saskatchewan. Interment was made in the old home town of Amherst, N. S.

David Chenier, prominent pulpwood contractor of Cochrane, Ont., has been chosen by the Liberal-Conservative convention at Proquois Junction to contest the North Temiskaming riding in the approaching Federal elections.

Kymmene Aktiebolag Denies Rumors

Editor PAPER TRADE JOURNAL:

Our attention has been drawn to a Bulletin of the American Newspaper Publishers Association, which refers to rumors of suggested agreement between the European news print mills and the Canadian news print mills, to discontinue sales of European news print in this market.

As far as the Kymmene Aktiebolag of Finland are concerned, whom we represent in this market, there is not a word of truth in this suggestion and we cannot do better than quote to you the cable we have just received from them on this subject. Kymmene's cable reads (the phraseology is the result of the original cable being in code):

"We have been informed that there are rumors among buyers that Montreal meeting suggested price quantity arrangements next year between Canada and Europe for your market stop. Such arrangements do not exist. We are open to sell all we want to United States of America. Please use this information at your discretion."

Should you wish to publish this letter, dealing as it does with a matter so vital to American newspaper publishers, you are at liberty to do so.

Very truly yours,
L. C. F. RAIN,
For H. Reeve Angel & Co., Inc.

Howard Marston Improving Slowly

DAYTON, Ohio, June 16, 1930.—Latest report from the Miami Valley hospital where Howard Marston, general manager of the International Envelope Company has been ill for several weeks, is that he is improving, following a recent set-back.

Mr. Marston's condition is considered more hopeful now than at any time since his recent illness. His brother who was summoned to Dayton when he suffered a relapse, following an attack of pneumonia, has returned to the East.

Several weeks ago he was stricken and though he seemed to be recovering in time after a period of uncertainty, the relapse came unexpectedly and the turn for the worse alarmed his friends. Hospital attaches say that barring weakness and possible strain on the patient's heart, his early recovery is expected.

Paper Demand Mostly Seasonal In Chicago

Book Paper Market Stimulated By Increased Activity of Local Printers—Fine Papers Practically Unchanged With Prices Remaining Steady—Some Improvement Noticed In Paper Board Section—Lower Grades of Paper Stock Continue to Exhibit Weakness

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 23, 1930.—Some increased activity on the part of Chicago printers has had a stimulating effect on the book market where prices remain steady and the volume at least as good as expected. Fine papers continue about the same as last week with a steady market and no price changes. This market, according to representatives here, will go into the dull periods unchanged but with better than average prospects for Fall months. Prices are eased up in the board market but the market itself has been more stimulated than looked for in most quarters.

News Print Only in Fair Shape

News print is in only fair shape as the expected volume of newspaper advertising has failed to materialize. Prices are unchanged. Some price cutting is reported in wrapping papers. The kraft prices seem to have found a low level as the prices were said to be little or unchanged through the week just passed. Prices are off on the lower grades of waste paper with krafts, print manilas, old news and mixed papers quoted down. The higher grades remain fairly good.

Paper Salesmen Hold Golf Tourney

The Chicago Division of the Salesmen's Association of the Paper Industry put in its biggest holiday on June 19 when more than sixty salesmen and their guests shot out their golfing competition over the sporty Westmoreland Country Club course, just north and west of Chicago. As Frank Prentiss, golf chairman, said, these monthly meetings of the Chicago group are attracting attention from all parts of the country. There were players at Westmoreland last week who have their regular golfing memberships in New England, in Indianapolis, Detroit, Kansas City, in northern Wisconsin and other points. A luncheon and a dinner were the highlights of the day, other than golfing, though the singing in the locker rooms and showers was of the highest "close harmony" order. And the prize winners. There were many of them for these salesmen hase a specially prepared way of making everybody—dub and expert—feel happy. Low gross was won by Herb Nichols, of the Northern Paper Mills; low net by D. Stetson, of American Writing, and the blind bogey by Creighton Whiting, of American Writing. Low net for the first nine was copped by Bill Libby, of Brown Company, and low net for the second nine by Mr. Snyder, of the Central Wax Paper Company. Low putts honors were taken by Buzz Gibson, of Mosinee, who used up only thirty during the eighteen holes. The low net foresome, composed of W. S. Lee, of Sealrite, J. Martenson, C. Kinnan and F. Spencer, shot a total of 319 strokes. Low score for the three par holes was taken by Clarence Buskirk, of the Michigan Paper Company. High gross honors were gratefully accepted by J. H. Cowhill, of Tomahawk, while the second high gross was won by Harold Telfer, of Detroit Sulphite. The high gross foresome, with Rube Swan of International; Ed Topping of Whitaker, Walter Cox of Paterson Parchment, and Frank Petrine, of American Paper Merchant, aggregated 457 strokes before they could call it a day. The whole day was a decided success—weather perfect. The next event will be staged at the Park Ridge Country Club on July 18. The Park Ridge course is another of Chicago's finest clubs and the salesmen will be expecting an even bigger crowd for the day's play. The Westmoreland hospitality was extended by Warren Moore, of the Brown Company, to whom the men are eternally grateful for the good time.

Chicago Paper Merchants to Meet

The next meeting of the Chicago Paper Association is scheduled for Tuesday evening, June 24, at the Bismarck Hotel, according to word from D. F. Peck, president. Continued interest will be displayed in a study of costs of handling merchandise and eliminating from lines those items which do not pay a profit. The meeting will be the first following that held earlier in the month when Frank Floyd, secretary of the National Paper Trade Association, and Arthur Blackman, of D. F. Munroe Company, addressed the entire group. The Chicago Paper Association is discussing with its members the advisability of buying from mills only enough paper which they may be able to sell normally through their own houses, thus doing away with an overstocked condition brought about by the buying of large quantities at a price reduction.

News of the Chicago Paper Trade

Westvaco Inspirations for Printers, No. 56, has been sent out from the West Virginia Pulp and Paper offices at 35 East Wacker drive, Chicago. Some of the interesting titles, which are expanded on and illustrated include "Eyes Remember—When Ears Forget"; "Lights and Shadows"; "Camera Eloquence"; "Suggesting Poster Power—A New Measure of Advertising Value"; "Proving That the Simplest Printing Job Involves Two Colors"; "Personality in Modern Advertising" and "Direct Mail Novelties." This issue of Westvaco is well on a par with past efforts, the discussions of educational value and the illustrations well fitted to the copy.

"To remind you to try it," is the interesting title of the Allied Paper Company's newest booklet on Allied Velour, a folding coated paper that is meeting with a warm reception in Chicago paper circles. The paper has a rag base, prints excellently, is strong, has a good surface and folds well. The main story of the paper is contained in a four page folder, extremely well printed with red, black and white as the color set-up.

Twenty-eight paper merchants in Chicago have adopted the plan of credit control which is one of the chief programs in Chicago receiving the support of both printers and paper merchants to improve conditions in the industry. The Master Printers Federation of Chicago is behind the plan, also, and recently carried in its house organ a list of the Chicago paper merchants who are supporting the credit control plan.

The J. W. Butler Paper Company of Chicago, is issuing new sample charts of its lines of thin papers, Derby Folding Bristol and Estra No. S. & S. C. Document which are conveniently bound for filing and ready reference.

An interesting folder from the Moser Paper Company mentions a new specimen portfolio of Colonel Bond which its manufacturer, the Riverside Paper Corporation of Appleton, Wis., will mail out on request. The folder carries the title "What Tub Sizing Does to Colonel Bond."

Agreement Reached With Great Lakes Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., June 23, 1930.—Following lengthy negotiations it was announced this week by officials of the International Brotherhood of Papermakers that an agreement had been reached with the Great Lakes Paper Company at Fort William, Ont., calling for an increase of twelve cents an hour over the previous scale to the employees in the newsprint division. The entire trouble revolved around the huge machine recently built by the Bagley & Sewall Company which is said to be the largest in the world turning out newsprint. The matter became serious and a strike was threatened of the 2,000 workers involved in the negotiations. Officials of the International organization have been invited to address the holiday crowds in Newfoundland on July 28.

News Print Mills Oppose Higher Freight Rates

Hearing of Application of Canadian Railways For Average Increase of Approximately 30 Per Cent Before Board of Railway Commissioners At Ottawa Adjourned Until October 6—Nearly All Large Canadian Paper Manufacturers Represented At Hearing

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 23, 1930.—The Board of Railway Commissioners in Ottawa has been continuing the hearing of the application of the railroads for increased freight rates on news print, and as it was found that it would take at least two more weeks to complete the case, and as the Railway Commissioners had not this time available at present, the hearing has been adjourned until October 6. Both the Canadian Pacific and the Canadian National Railways about a year go published notice of their intention to raise the rates. The average increase sought is about 30 per cent, and it is stated that about $1,500,000 annually in freight rates, affecting both Canadian and American railroads, is at stake. The hearing is a repercussion of a case heard before the Interstate Commerce Commission of the United States on the rates to be charged on news print made and consumed in that country. Judgment in that case has not yet been rendered.

Nearly every large paper concern in Canada has been represented at the hearing in Ottawa. The arguments of the railroads is that the present rates are too low and that the news print traffic does not pay for itself. It has been argued that when the Canadian industry was in its infancy, the present rates were placed in effect to allow it to grow and prosper. Now that the industry has grown to its present proportions, it is argued that the rates should be increased. News print manufacturers contend that the proposed higher rates would place them in an unfair and unfavorable position in the United States markets with the manufacturers of that country.

So far, practically all the evidence presented has been of a very technical nature, chiefly hypothetical rate suggestions and comparisons with existing rates all over the continent. Rate experts and traffic management experts have presented the bulk of the evidence so far. Next to perishable goods, the news print traffic receives priority over all other freight on Canadian railroads, the board was told by traffic men of the Canadian National Railways and the Canadian Pacific Railway. Special cars are necessary for news print, the traffic must be speedy, and in all respects the traffic is given much priority, the board was told. It is being claimed by the railroads that because of these conditions, together with the steep grades and low weather averages encountered in the districts where the news print plants are located, the necessary traffic is not a paying proposition under present rates.

Lumber Changes During Transit

The Forest Products Laboratories of Canada, is making an interesting study in the behavior of lumber in transit from the Pacific Coast. The Vancouver laboratory has arranged to place in carloads of lumber consigned to Montreal and Ottawa a number of boards the moisture content of which was determined in Vancouver. Through co-operation with eastern consignees, the Ottawa and Montreal laboratories have been checking up these moisture contents on arrival in the east, to determine the amount of moisture absorbed in transit.

Water Shortage Affects Pacific Mills Earnings

The annual report of Pacific Mills, Ltd., which operates a paper plant at Vancouver, shows that for the year ended December 31 last, net earnings were $365,562, as compared with $954,961 in 1928. The decrease was due largely to a shortage of water, which necessitated shutting down three machine for several months.

The directors' report states there had been no improvement in prices for the company's products, but volume of business sufficient to keep the plant in operation to capacity is anticipated for the current year. During the year the sum of $1,386,520 was expended in additions and improvements to plant which consisted chiefly in the rebuilding and replacement of old facilities, acquired from the Ocean Falls Company, Ltd., with modern buildings and equipment, also in the installation of additions to the steam power plant. These capital expenditures are expected to effect further economies in operation of the mills and will permit of full production at all times, regardless of water power conditions. The company is at present engaged in extending its operations through erection of a paper specialties plant at Vancouver.

News of the Wisconsin Paper Industry

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 23, 1930.—Operations have been practically suspended by the Brown Paper Goods Company, Rhinelander, Wis., according to announcement made last week. All employees have been laid off except four, who will take care of what orders are received. It is expected that the plant will be closed down entirely within a month until conditions improve. The company also has a plant of larger size in Chicago, and is not receiving enough orders to keep both in operation, according to Spencer Brown, manager. An addition was built to the Rhinelander plant a year ago to take care of increased trade.

Another shut down has been ordered in the case of the Marinette and Menominee Paper Company, of Marinette, Wis. Because of lack of orders, the branch mill at Menominee, Mich., has been closed entirely and no statement is available now as to when it may reopen. The Marinette mill continues to operate.

Operations have been started by the Allan Waste Paper Company, of Menasha, Wis., with ten persons employed. They are working in a new building just completed for this work. As soon as these workers are trained, the personnel will be increased, according to Fred M. Rosenthal, manager.

Louis J. Marshall, president of the Marshall Paper Company, wholesalers, of Appleton, Wis., has been spending some time in Washington, D. C., in the interest of standard sizes on paper wrapping tape of the adhesive type. He has been acquainting the standardization committee of the Bureau of Standards, Commerce Department, with the needs of the trade, both as to sizes of tape and thickness and texture of paper.

William C. Wing, president of the Fox River Paper Company, Appleton, Wis., and the Nicolet Paper Company, DePere, Wis., will find most of his pleasure this summer in motor boating. He has purchased a 45-foot cabin cruising launch, powered with two motors developing 200 h.p. The boat is docked on Lake Winnebago near his home at Neenah, Wis.

Swedish Paper Market Quiet

The Swedish paper market was rather quiet during the first quarter of the year, with few incoming orders and with low prices, especially for kraft and sulphite paper according to a report from Consul H. C. von Struve at Goteborg. It is considered likely, he states, that the prevailing uncertainty with reference to the time when the paper mill owners can make new wage agreements with their mill hands has contributed to this, in addition to the fact that the paper market in general has been dull. The situation has been somewhat better in the news print field, the mills being well provided with orders. It is even reported that some of them have sold out the quantity regularly intended for the domestic market.

New York Trade Jottings

Harry P. Gould, president and treasurer of the Gould Paper Company, of Lyons Falls, N. Y., was a prominent New York visitor last week.

* * *

C. P. Hewitt & Bros., Inc., general paper merchants, are now installed in their new quarters at 23-25 Green street, New York. Telephones Canal 8450-1-2-3-4-5.

* * *

Application to list 3,120 additional shares of common stock of the Scott Paper Company without nominal or par value is pending before the committee on stock list of the New York Stock Exchange.

* * *

Geo. W. Millar & Co., Inc., of 284 Lafayette street, New York, which recently absorbed the Domestic Paper Mills Company and Charles W. Rider & Co., request that all communications regarding these two concerns should be addressed direct to the above address.

* * *

Henry Draudt has joined the staff of the pulp department of Price & Pierce, Ltd., of 17 East 42nd street, New York. Mr. Draudt was formerly associated with M. Gottesman & Co., Inc., of 1440 Broadway.

* * *

With optimism predominant in the minds of the firm of Bulkley, Dunton & Co., general paper merchants, they have taken over the entire building at 75-77 Duane street, New York, and a thorough renovation has taken place, with the establishment of their principal offices on the first and second floors. Their old sign remains over the windows of the ground floor and is a cherished emblem of nearly one hundred years of successful business, as in 1933 their century mark will have been reached, surely a record to be justly proud of.

Bids for Government Paper

WASHINGTON, D. C., June 25, 1930.—The Government Printing Office has received the following bids for 3,200 pounds of 24x36—320, H.F. red sulphite paper: Barton, Duer & Koch Paper Company, at 9.55 cents per pound; Reese & Reese, Inc., 9.35 cents; Whitaker Paper Company, 11.42 cents; Tarentum Mills, 7.535 cents; R. P. Andrews Paper Company, 4.6 cents; Charles G. Stott & Co., 9.4 cents; and Dobler & Mudge, 10 cents.

The following bids were also received for 40,000 pounds of manila calendered tag board in 23¼ inch rolls: Whitaker Paper Company, at 7.13 cents; and Barton, Duer & Koch Paper Company, at 7.2 cents.

The Printing Office also received the following bids for 3,000 sheets of 22x28, gray photo mount board, 22x28: R. P. Andrews Paper Company, at 6.6 cents per sheet; Charles G. Stott, at 6.59 cents; Old Dominion Paper Company, 7.398 cents; Barton, Duer & Koch Paper Co., 5.25 cents; and Whitaker Paper Co., 5.25 cents.

George W. Sisson Jr. on Forest Conservation

POTSDAM, N. Y., June 23, 1930.—George W. Sisson, Jr., head of the Racquette River Paper Company, recently appeared before President Hoover to give his views on forest conservation and his visit is held partly responsible for the appointment of a National Conservation Board. His intimate acquaintance with and knowledge of forest conservation, of which he has been a close student for years, together with his position among the lumber and paper interests of the country, make his opinion and advice of good weight. Mr. Sisson feels keenly that unless some action is taken soon for the preservation of the timber interests there is real danger and that there is need of a constructive study of the problem by the federal government.

Boston Paper Trade Happenings

BOSTON, Mass., June 23, 1930.—The June number of "How," published by Tileston & Hollingsworth Company, and edited by A. V. Howland, is full of suggestions to the printing trade on how to expand business. The analysis of the June Calendar sheet, by Charles R. Capon, is given.

Floyd L. Miller, general sales manager of the Barta Press, gave a talk on catalog printing to the sales force of Carter Rice & Co. Corp., June 21. The meeting was the sixth in the educational series being held by the paper firm and the last until next fall. Mr. Miller discussed the better grades of books and catalogs, bringing up several points useful to paper salesmen in working with printers who handle this type of work.

The Groveton Paper Company, Inc., has improved its service by trucking two or three times a week from its mill in Groveton, N. H., into the Boston territory.

An examination to determine what they had assimilated from a series of lectures at the office of their company was given to the junior salesmen of Storrs & Bement Company, at the office of the firm June 21.

Elliott Wight, advertising manager of the United States Envelope Company, gave a talk June 21 to the salesmen of Storrs & Bement Company, in connection with the campaign for the Columbian White Wove Envelopes.

Knight, Allen & Clark, Inc., have added three new lines of paper. One is the Duplex Woodbine Enamel in six new color combinations, which they are stocking in Boston. Another is a new Wheelwright line, Wavetone. Both are to be in the Boston warehouse soon. A third is Deputy Bond, white only, pole dried and rag content, which is being sold at a low price.

E. D. Wallin, of the Arnold-Roberts Company, has been enjoying a few weeks' automobile trip to the Middle West, including Chicago, accompanied by Mrs. Wallin.

W. E. Smiddy, of the Missisquoi Corporation, called on the Boston trade last week.

Lodding Corp. Specializes in Doctors

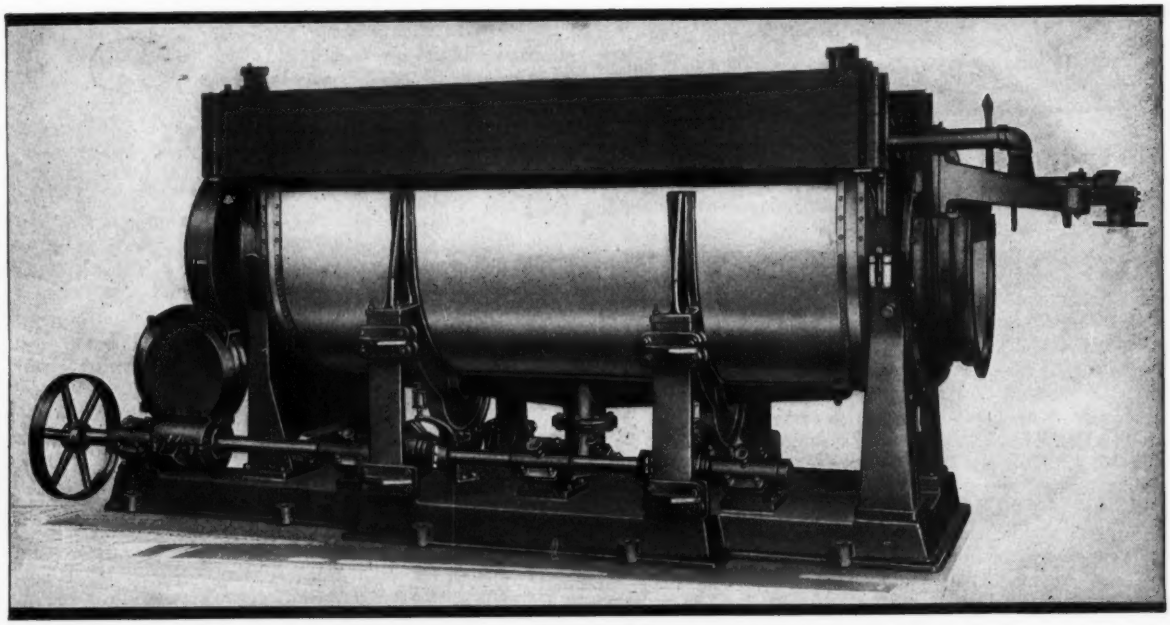
F. W. Lodding, for 12 years associated with Rice, Barton & Fales, Inc., the last five of which he was chief engineer for this concern, just one year ago organized his present company, The Lodding Engineering Corporation and started in the business of manufacturing paper machine doctors, specializing in this type of equipment. The subject of the use of doctors was one which had received little or no consideration, a doctor being regarded as of little importance, but with the vast improvements made in all types of pulp and paper mill equipment in recent years, specific attention is now being given to every detail connected with such equipment and doctors have come into full recognition of their importance as a part of paper machine equipment. The Lodding Company is making doctors of all kinds for breast rolls, press rolls, dryer, calender and creeping doctors. As time progresses the Lodding Engineering Company contemplates entering into the production of a more extensive line of special pulp and paper mill machinery.

To Build Conversion Plant at Longview

LONGVIEW, Wash., June 20, 1930.—H. C. Hornby, president of the Northwest Paper Company, Cloquet, Minn., which is associated with the Weyerhauser Timber Company, has announced that a wood conversion plant will be constructed in Longview, but no date has as yet been announced for construction to start.

At Longview the assumption is that the plant would be a large one, although Weyerhauser officials are non-committal. The plant would manufacture pulp and pulp board and probably several by-products which are now made by the Northwest Paper Company at Cloquet, of which the largest is balsam wool, an insulating material that is advertised largely by the Weyerhauser sales corporation.

IN YOUR BATTLE WITH COSTS



WATCH YOUR SCREENS

BIRD MACHINERY

Well-managed mills, taking advantage of every chance to force costs down, choose Bird Screens. They get superior performance, at the lowest cost per ton.

Let us show you how Bird Screens will bring real economies to your mill.

BIRD MACHINE COMPANY

SOUTH WALPOLE ◆ MASSACHUSETTS

4170

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Cloquet, Minn.—The Northwest Paper Company, Cloquet, has completed plans for a new addition to mill in connection with an expansion and improvement program inaugurated a number of months ago. The structure will be one-story, 125x725 feet, and will be equipped for increased capacity in machine department, beater room and finishing division, developing an output of about 70 tons a day in addition to present mill rating. General building contract has been let to the James Leek Company, Minneapolis, Minn., and award for paper-making machine has been given to the Beloit Iron Works, Beloit, Wis. The entire project is estimated to cost close to $1,500,000, and is scheduled for completion in the Fall. The Jacobson Engineering Company, Plymouth Building, Minneapolis, Minn., is engineer. H. S. Hornby is president.

Albany, N. Y.—The paper storage plant of the Empire Paper Company, Albany Waste Paper Company and the E-Z Bag Opener Company, South End District, formerly used as a freight building by the Delaware & Hudson Railroad, was damaged by fire June 17, with loss reported in excess of $35,000, including stock. It is understood that the structure will be rebuilt.

Philadelphia, Pa.—Beck, Smith & Page, Inc., Water Street and Snyder avenue, manufacturers of wall papers, has authorized plans for construction of new addition to mill, consisting of a two and four-story, brick, steel and concrete structure, to cost close to $100,000, including equipment. Considerable increased capacity will be carried out. It is understood that bids will soon be asked on general contract. The Ballinger Company, 12th and Chestnut streets, is architect and engineer in charge.

Panama City, Fla.—The Southern Kraft Corporation, 466 Michigan avenue, Mobile, Ala., a subsidiary of the International Paper Company, 100 East Forty-second street, New York, has awarded a contract to the Stupp Brothers Bridge & Iron Company, 8326 avenue G, St. Louis, Mo., aggregating about 2,000 tons of steel shapes for initial units of proposed new kraft paper mill on large tract of land recently acquired at Panama City. Work will be placed under way at an early date, and a number of buildings are scheduled for completion in the Fall. A list of machinery to be installed is being arranged, and it is understood that contracts will be placed in near future. The entire project is reported to cost over $5,000,000.

Stanton, Del.—The Ad-Tissue Corporation, Stanton, manufacturer of printed tissues for advertising purposes, is said to be planning the early rebuilding of portion of local mill, destroyed by fire June 19, with loss estimated at more than $175,000, including equipment. Reconstruction will approximate the amount of fire loss.

Ridgefield, N. J.—The Lowe Paper Company, River road, has plans maturing for a new plant unit at local mill, to be one-story and basement, 46x115 feet, designed primarily as a filter plant. It is reported to cost close to $50,000, with equipment. Fred L. Smith, 21 East 40th street, New York, is architect and engineer.

Chicago, Ill.—The Lanzit Corrugated Box Company has leased the first floor of its building at 2509 West 42nd street, to the Berger Manufacturing Company, Canton, Ohio, which will occupy for another branch of production.

Chicago, Ill.—J. J. Bauer & Company, 1038 North Ashland avenue, manufacturer of paper boxes and containers, has plans under way for alterations and improvements in three-story factory. It is understood that incraesed capacity will be arranged. Estimated cost has not been announced. Louis Lurvey, 8 Ogden avenue, is architect.

San Francisco, Cal.—The National Automotive Fibers, Inc. 310 California street, San Francisco, has recently purchased considerable machinery, formerly used at the plant of the Ford Motor Company, Los Angeles, for the manufacture of fiber padding for automobile seat cushions, and will install at its plant at Oakland, Cal., for increased capacity. It is understood that the company has arranged a contract with the Ford company to furnish fiber materials for its requirements. Automotive Fibre Company has lately completed a new plant at Detroit, Mich., which was placed in operation in May; this plant is now running at about one-half full capacity and is expected to develop maximum output within the next sixty days, giving employment to a larger working force. This plant will furnish requirements for Ford, Chevrolet and Chrysler automobiles, and is understood to have booked some heavy future orders. J. R. Millar is treasurer of the company.

Bogalusa, La.—The Bogalusa Paper Company has completed plans for the construction of a new one-story and basement addition, 43x335 feet, to be used as a machine room for its corrugated paperboard division. General contract for superstructure has been let to H. J. Cowgill, Bogalusa, and work will proceed at once. Considerable increase in present output is being scheduled. The expansion is reported to cost over $200,000, with equipment. R. H. Laftman is vice-president and general manager.

Bridgeport, Conn.—The Forney Spool and Fibre Company, recently organized with capital of $50,000, by H. N. Keefer, Bridgeport, and associates, is said to be planning the early operation of local mill for the manufacture of fiber spools and kindred fiber goods. Others interested in the new organization include A. M. McKeen and L. S. Frankel, both of Bridgeport.

Boston, Mass.—The Flintkote Company, manufacturers of paper roofing materials, etc., is developing increased capacity at its different plant units, and will hold to the new schedule for an indefinite period. The Pioneer Paper Company of California, Inc., a subsidiary, is said to be doing a volume of business comparing favorably with that of a year ago, at its Los Angeles plant. The parent company has recently placed a new mill in service at New Orleans, La., and is running at good capacity at its branch plant at Rutherford, N. J.

Ashland, Wis.—The Marathon Paper Mills Company, Rothschild, is said to have begun construction of new addition to mill for which contracts were recently let and push the work to early completon. New unit will be one-story, 100x124 feet, reported to cost approximately $100,000, with equipment.

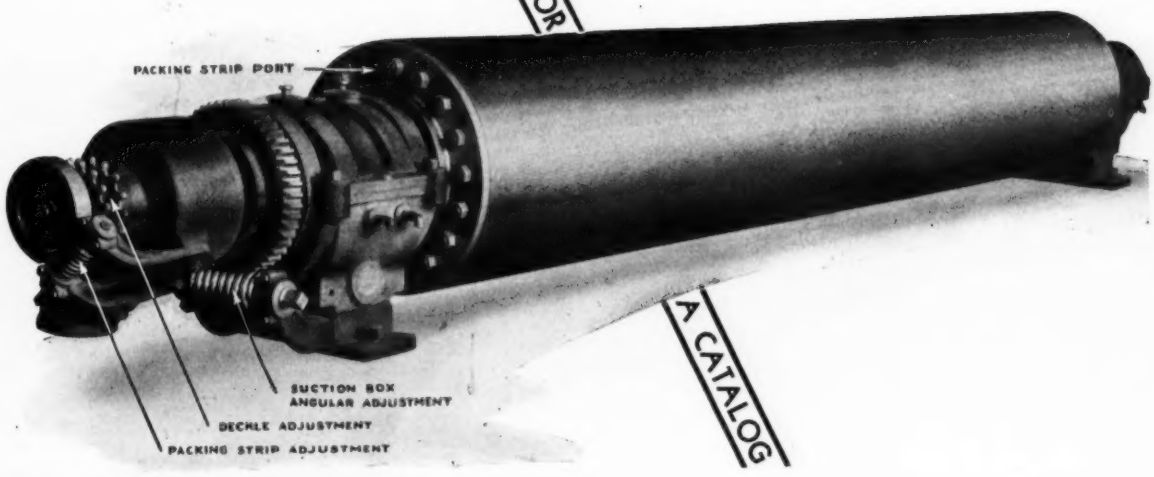
Mobile, Ala.—The Champion Coated Paper Company, Hamilton, Ohio, is currently reported as inspecting a number of sites in the vicinity of Moble, Ala., for a proposed new pulp and paper

WRITE YOUR NAME AND ADDRESS ON THE MARGIN OF THIS PAGE AND MAIL IT TO US FOR A CATALOG

A certain newsprint mill added 8 tons to the daily production of one machine, solely because of the installation of Downingtown Suction Rolls. This installation has increased the life of the wires and felts and the company has since equipped two other machines with Downingtown Suction Couch and Press Rolls. The design and construction of the Downingtown Roll materially contributed to this production increase, which was derived from the suction roll operating principle. New catalog, sent on request.

DOWNINGTON KILBERRY PATENT SUCTION ROLL

Downingtown Manufacturing Co.
Downingtown, Pa., U. S. A.



mill, and it is understood that decision will be made regarding contemplated plant at an early date. The company has acquired property at Tuscaloosa, Ala., and has been reported to be planning proposed mill at that place. The project will consist of a number of producing units to cost over $5,000,000.

Hilo, Hawaii—The Hawaii Cane Products Ltd., Honolulu, recently organized to take over the properties of the Hawaii Cellulose, Ltd., is arranging for early construction of a proposed new plant unit on a 25-acre tract of land at Hilo, adjoining the property of the Waiakea Mill Company. The initial mill unit will be given over to the production of insulating board and wall board, utilizing sugar cane waste as raw material, while later plant divisions are planned for the production of paper boxes and containers, rayon, synthetic lumber and kindred products. The project will cost over $1,000,000. Raw material or baggasse will be furnished to the new plant by three major interests, including the Hilo Sugar Company, Waiakea Mill Company and the Olaa Sugar Company, all operating in this district. John E. Russell, managing director of Theodore Davies & Company, Honolulu, will be president of the new company; Walter F. Dillingham, president of the Oahu Railway & Land Company, will be vice-president; and C. J. Henderson, treasurer.

New Companies, Etc.

Chicago, Ill.—Vortex Patents, Inc., 421 North Western avenue, an interest of the Vortex Manufacturing Company, same address, manufacturer of paper cups, etc., has filed notice of decrease in company capital from $100,000 to $50,000.

New York, N. Y.—Reliance Paper and Twine Mills, Inc., 1 Bond street, has arranged for change in company name to the Reliance Paper and Twine Corporation.

Wilmington, Del.—The Bast Fibre Process and Equipment Corporation, care of the Corporation Trust Company of America, duPont Building, Wilmington, has been incorporated under state laws, with capital of $100,000, to manufacture and deal in fiber products and fiber-making equipment.

New York, N. Y.—The U. S. Paper Box Machine Company has been incorporated with a capital of $100,000, to manufacture and deal in equipment for the production of paper boxes and containers. The company is represented by Benjamin Antin, 295 Madison avenue, New York, attorney.

Albany, N. Y.—The Pacific Pulp Mill Corporation, a Delaware corporation, has filed notice of company organization to operate in New York, with a capital of 10,000 shares of stock, no par value.

Maurice Hoopes Gets Important Post

GLENS FALLS, N. Y., June 23, 1930.—Announcement was made this week that Maurice Hoopes, president of Finch, Pruyn & Co., had been appointed a member of the committee on public expenditures by the New York State Economic Congress. The organization is now devoting considerable attention to general industrial conditions throughout the state and methods needed to bring improvement. Other members of the committee are Dr. G. B. Cutten, president of Colgate University; John L. Train, of Utica, and George McAneny, chairman of the New York Transit Commission.

New Water System at Fort Lauderdale

Fort Lauderdale, Fla., recently installed a new water works system, comprising processes designed to get rid of color, taste, hardness and deposits in services and meters and to control the bacterial content, including deareation, chemical treatment, mechanical agitation for mixing, sedimentation, carbonation, filtration and chlorination. The system was described in an article by F. J. Keis, which originally appeared in *Engineering News Record* and which has been reprinted and is now being distributed by the De Laval Steam Turbine Company, Trenton, N. J., builders of the pumping equipment.

Port Huron Conducts Advertising Campaign

[FROM OUR REGULAR CORRESPONDENT]

PORT HURON, Mich., June 21, 1930.—The Port Huron Sulphite and Paper Company announces that it has obtained gratifying results from an extensive international advertising campaign that it has been carrying on recently on two of its stock lines. In connection with its 1930 advertising, it has been sending out an attractive portfolio showing outstanding advertisements of the Port Huron products and also two very attractive booklets showing samples of its Featherweight Bond and its Embossed Leatherette covers.

These papers have already been placed exclusively with a number of distributors throughout the country and this list of distributors is still being expanded. The list at present includes the following distributors:

HURON FEATHERWEIGHT BOND—The Whitaker Paper Company, 124 Walker street, Atlanta, Ga.; Paul E. Vernon & Co., 22-26 Reade street, New York; Forest Paper Company, Inc., 334 Hudson street, New York; Geo. Millar & Co., Inc., Holden & Hawley Div., 284 Lafayette street, New York; Steiner Paper Corporation, 50 Franklin street, New York; Royal Card and Paper Company, 11th avenue at 25th street, New York; Lewmar Paper Corporation, 72-76 Mechanic street, Newark, N. J.; Barton Duer & Koch Paper Company, Baltimore Road, Washington; United Paper Company, 104 Virginia street, Richmond, Va.; General Paper Company, 568 Howard street, San Francisco, Cal.; Inter-City Paper Company, East 3rd and Pine streets, St. Paul, Minn.; Bermingham & Prosser Company, 2112 Central street, Kansas City, Mo.; Bond-Sanders Paper Company, 527 Eighth avenue., S., Nashville, Tenn.; Chope-Stevens Paper Company, 1915 Fort street, W., Detroit, Mich.; A. Hartung & Co., 506-512 Race street, Philadelphia, Pa.; Wilcox-Walter-Furlong Company, Philadelphia, Pa.; J. L. N. Smythe Company, Philadelphia, Pa.; The Chatfield Paper Corporation, Cincinnati, Ohio; Seaman Paper Company, 93 Mississippi street, Buffalo, N. Y.; Dwight Brothers Paper Co., 626 S. Clark street, Chicago, Ill.

EMBOSSED LEATHERETTE—General Paper Company, San Francisco, Cal.; Chicago Paper Company, Chicago, Ill.; Parker, Thomas & Tucker Paper Company, Chicago, Ill.; Alling & Cory Company, Cleveland, Ohio; Chatfield Paper Corporation, Cincinnati, Ohio; Minneapolis Paper Company, Minneapolis, Minn.; Stilwell Paper Company, St. Paul, Minn.; Bermingham & Prosser Company, Kansas City, Mo.; United Paper Company, Richmond, Va.; Chope-Stevens Paper Company, Detroit, Mich.

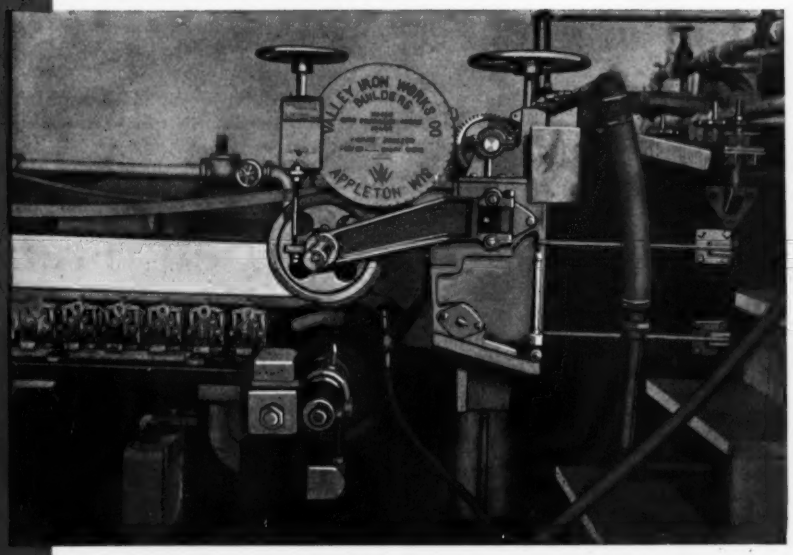
Special Issue of Finnish Paper Journal

As usual, The Finnish Paper and Timber Journal has this spring published the Annual Special Issue containing a great number of articles and reviews dealing with various aspects of the woodworking industries of to-day. The value of the Issue is enhanced by numerous illustrations, maps and diagrams.

Of special interest to readers abroad is the comprehensive English Section, giving up-to-date information about developments in the various markets as well as on recent industrial extensions in Finland and a number of historical notes on woodworking activities in the country. Among these articles should especially be mentioned an instructive expose of new developments in the timber trade, a review of the American plywood market and another of North European timber exports to Mediterranean countries, as well as a description of the new large greaseproof machine just installed at Mänttä.

In the general section many of the leading Finnish woodworking chemists publish instructive results of their recent investigations, most of which refer to matters at present in the focus of scientific interest in all paper and cellulose manufacturing countries. A good deal of space is also devoted to articles dealing with engineering and other technical matters, written by recognized specialists.

LOW SPEED or HIGH SPEED



286 installations now in daily operation in 140 progressive mills in United States and Canada.

HEAVY STOCK or LIGHT STOCK

Do you know that now—through new features of construction—the Voith Inlet offers you all of the advantages of operation on heavy papers at slow speeds that it does on lighter papers at high speeds?

Do you know that you can change deckles while the machine is running . . . that one man can accurately control the orifice opening in front of distributing roll . . . that wires are given longer life . . . that formation is decidedly better . . . and that you can have better control of weight uniformity?

All these things—and others which we lack space to mention here—go together to provide the vastly superior, all-around efficiency and finer quality which you can expect to get from the Voith Inlet.

Address your inquiry to the Valley Iron Works Co., Appleton, Wisconsin.

VALLEY

Equipment for Paper and Pulp Mills

New York Office: 350 Madison Ave.
Western Mfg. & Sales Div.: Smith & Valley Iron Works Co., Portland, Ore.
Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by Reginald Trautschold Consulting Engineer

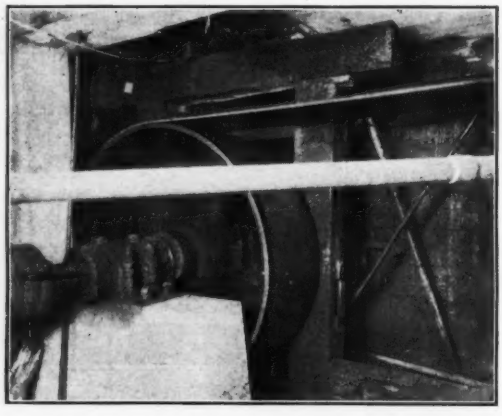
Developments in Driving Belt Transmissions[1]

Gains in Efficiency and Compactness of Drives

With the multiplicity of different types of high quality driving belts now available, some of quite decidedly novel construction as viewed from standards of the past, it becomes more and more apparent that there is no one type of belting which can be considered most suitable for all operating conditions. The various approved varieties all have successful applications to their credit, installations ranking high in respect to the two outstanding requirements of endurance, or durability, and efficiency, so most certainly driving belts can no longer be selected at random and operated by rule of thumb methods. They are essential and important parts of the machine or equipment they serve and should command as much care and attention as any other part of the equipment.

All types of driving belts have certain inherent weaknesses, however, or particular physical characteristics lacking adequate endurance under certain conditions, which may place decided limitations upon the adaptability of the belt for specific applications. In arriving at a proper choice of belt, consequently, care should be given to have the construction of the belting and its treatment coordinate so far as possible with the physical conditions under which the belt is to operate. In this connection, two of the most dominant considerations are those of internal friction, caused by the resistance of the belt itself to torsion and tension, and surface friction, caused by belt slippage.

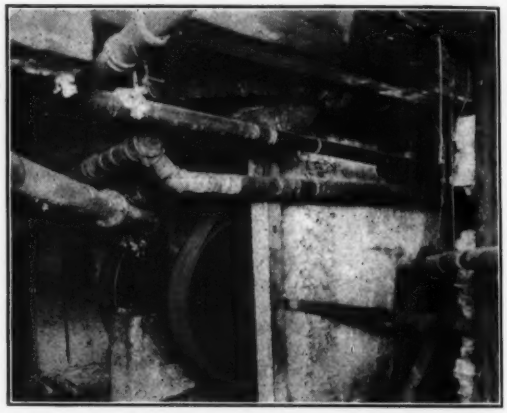
[1] For other discussions on belts and belting, see P. T. J., Feb. 23, 1928; July 26, 1928, and May 9, 1929.



Courtesy: United States Rubber Co.

FIG. 1.

Driven pulley at end of countershaft, showing driving belt from main lineshaft. —Union Wax & Tissue Paper Co.'s plant at Hamburg, N. J.



Courtesy: United States Rubber Co.

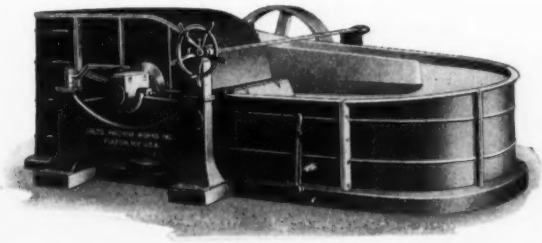
FIG. 2.

Section of countershaft, showing individual belts to driven equipment, the belt in the foreground going to the first of the beaters.—Union Wax & Tissue Paper Co.

As a basis for belting comparisons, though not necessarily a measure of belt superiority, leather belting naturally sets a standard. It antedates all forms of fabricated belting and while modern leather belts are very different from the strips of rawhide first employed they retain inherent characteristics to which the long success of leather belting and its marked adaptability, when subjected to proper treatment, are largely attributable. Furthermore, these are the same characteristics, pertaining to internal and surface frictions, that the builders of fabricated belts strive to equal and even surpass.

Natural Flexure and Adhesion

Internal friction is associated closely with flexure and in this respect a strip of leather possesses a natural capacity which sets a very high standard. The leather covered a living, breathing animal, protecting a continuously pulsating convex surface, subject, consequently, to continuous flexure, in effect, not unlike the bending duty of a driving belt passing about its pulleys. This inherent capacity of leather belting is so highly developed, in fact, provided the leather is subjected to proper and adequate protective treatment, that it cannot be duplicated by any like capacity conferred upon a flat fabricated belt. The nearest approach is, probably, in the case of a solid woven belt, in which the individual longitudinal strands are all subjected to more or less similar strains. In such construction, however, the incessant adjustment of the various longitudinal strands to



- WHY -

DILTS NEW TYPE BEATING ENGINES

mix more thoroughly, do their work faster and more economically than others.

This is the tenth of a series of advertisements, picturing some of the reasons—features, in design, and construction--which make Dilts New Type Beating Engines most suitable for your Beater Room requirements . . . . . *Ask for additional data.*

The above illustration shows a workman using a cold chisel made from a piece of our Fly Bar Steel. At the right is a section of a Fly Bar which has been bent. The special alloy steel Fly Bars which are built into Dilts New Type Beating Engines are tough enough to bend, yet hard enough to make into chisels. We also furnish untempered bars, laid steel and bronze bars.

DILTS MACHINE WORKS INC.
FULTON, N. Y.

"Your Paper Is Made In Your Beaters"

the differences in tension precipitated by the passage of the belting about the pulleys introduces other internal friction from which the leather belt, provided it is not bent excessively, is very largely free.

In order to realize the advantages from the capacity for natural flexure in leather belting, however, it is necessary that the right side of the belt be run on the pulleys and that the belt be subjected to no reverse bending, against which the natural flexure capacity of the belt may prove an actual detriment and not an asset. This peculiarity will be referred to again in advancing an explanation for the unsuitability of leather belting in a specific application.

In the case of solid woven belts, suitably constructed, which in respect to flexure capacity most nearly approach leather belting, the same limitation is not so pronounced and it is quite generally feasible to employ snubbing idlers in order to secure a greater arc of pulley contact and so permit a reduction in pulley centers. The greater flexure capacity of solid woven fabric belts tends to explain in part, also, the fact that such belts quite commonly possess somewhat greater transmission capacity that other types of fabricated belts.

Surface friction, caused by belt slippage, is an even more potent consideration and in this respect, also, quality leather belting sets a high standard, being held by some authorities to be the most satisfactory form of belt transmission, provided the belts are kept dry. Be this as it may, and the question is raised advisedly, for there are now excellent rubber and fabric belts on the market and rubber belting is a prime favorite with many pulp and paper mills, the pulley traction of a belt is of chief concern and almost all developments in driving belt transmissions have for their primary aim an increase in active capacity. A belt giving high pulley traction shows less slippage and creep, therefore, less friction, less burning and more power.

Other considerations than simply those of internal and surface frictions have to be taken into account in the selection of the most suitable belting for a specific service and application,

Courtesy: B. F. Goodrich Rubber Co.

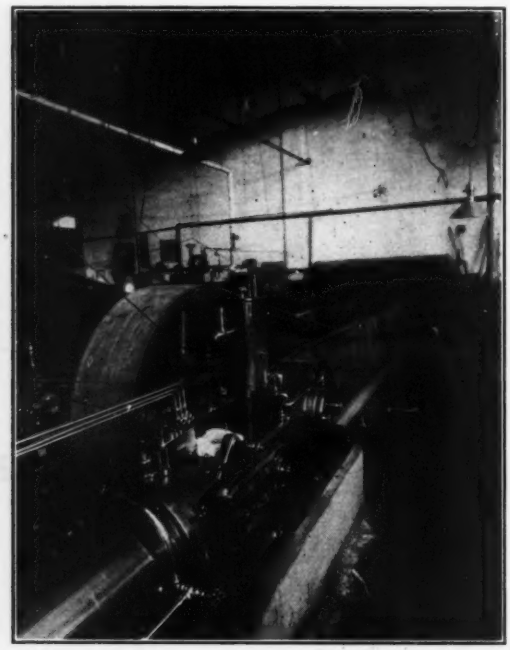
FIG. 5.

Beater drives at the Riverside Mill, Albemarle Paper Mfg. Co., Richmond, Va.

of course, and some of these, at least, can be brought out most conclusively by brief considerations and descriptions of typical installations of belting of various types. In advancing such exposition of modern belt drive practices in pulp and paper mill services, attention will be directed chiefly to the newer developments in drive belt transmissions and to those belts of distinctive constructions adopted to secure greater efficiency in the transmission of power and greater compactness of drives. High quality standard leather belts and the advisable modifications in belt proportions, etc., for drive services over taper pulleys having already been discussed to some extent in these columns, however, it would seem unnecessary to enlarge further upon such well established varieties of belt or upon such specific drive applications. In discussing other varieties of belts, on the other hand, some pertinent comments may well be advanced to bring out certain considerations of importance governing the selection of the belts.

Standard Flat Belts

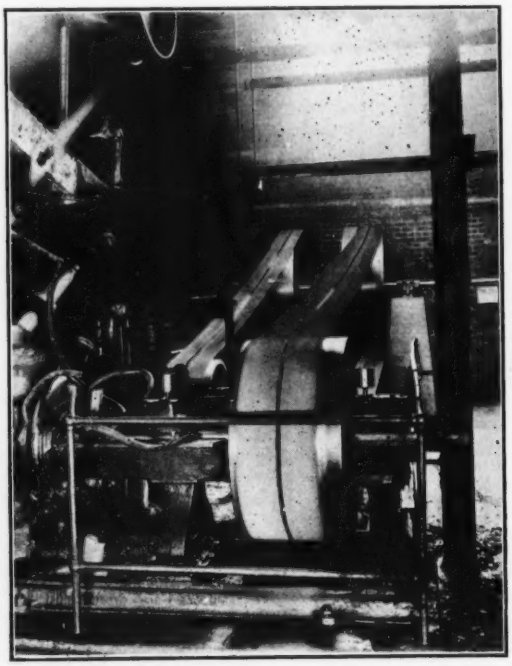
An interesting installation to present first is that of the



Courtesy: Cincinnati Rubber Mfg. Co.

FIG. 3.

18-inch, 8-ply belt driving paper machine from a variable speed, twin engine at a speed of 6,700 ft. per min.—Hopper Paper Co., Taylorville, Ill.



Courtesy: Cincinnati Rubber Mfg. Co.

FIG. 4.

Two 14-inch, 8-ply, fabric belts driving Jordan engines at paper mill of the Cherry-Burrell Corp., Tama, Ia.

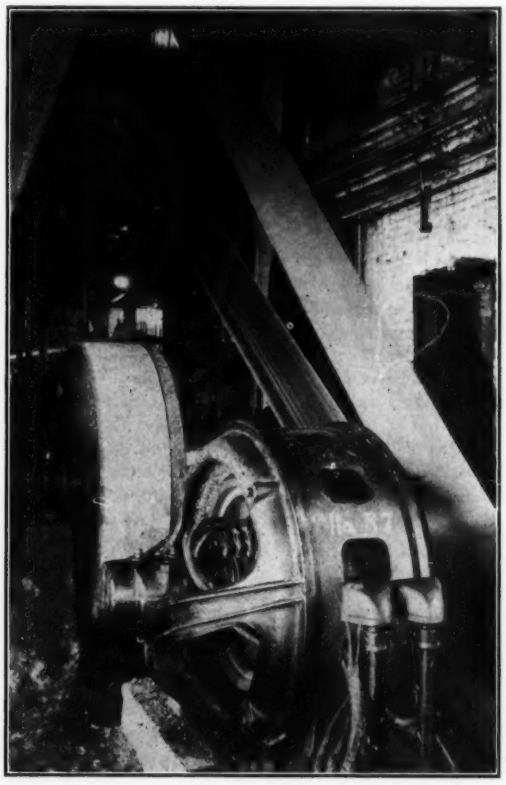
countershaft drive from the main turbine lineshaft at the plant of the Union Wax & Tissue Paper Company at Hamburg, N. J., one of the oldest paper mills in that state. The drive is especially noteworthy in that it is now one of the few paper mill belts still called upon to transmit between 400 and 500 horsepower under severe and inconvenient operating conditions and yet giving excellent service. The main turbine drives a lineshaft running through the entire mill and this main shaft in turn drives a countershaft, carrying a total connected load of 432½ horsepower, through a 24-inch, 10-ply, rubber belt. The drive is horizontal and the countershaft is in the basement mounted under the main machine floor, both driver and driven pulleys being 72 inches in diameter. The drive was originally designed to transmit about 230 horsepower, but at the present time it is transmitting well in excess of 430, an overload of from 85 to 90 per cent.

Despite this heavy overload, severe service and general inaccessibility of the countershaft, as is strikingly evident in the accompanying views, the drive has not only given an excellent account of itself, but has been in active service for the past eighteen months. Such record is sufficiently unusual, taking into account the heavy duty and severity of operating conditions, to arouse interest in the specifications for this sturdy 71-foot transmission belt.

COUNTERSHAFT DRIVE FROM MAIN LINESHAFT
UNION WAX & TISSUE PAPER CO., INC., HAMBURG, N. J.

Driven Equipment	Connected Load
6 beaters—1,000 to 1,600 lb. capacity	210 Hp.
2 Jordan engines—500 lb. capacity	150
3 stock chests	15
1 6-inch centrifugal water pump	20
1 4-inch centrifugal water pump	15
3 plunger stock pumps	22.5
Total connected load	432.5 Hp.

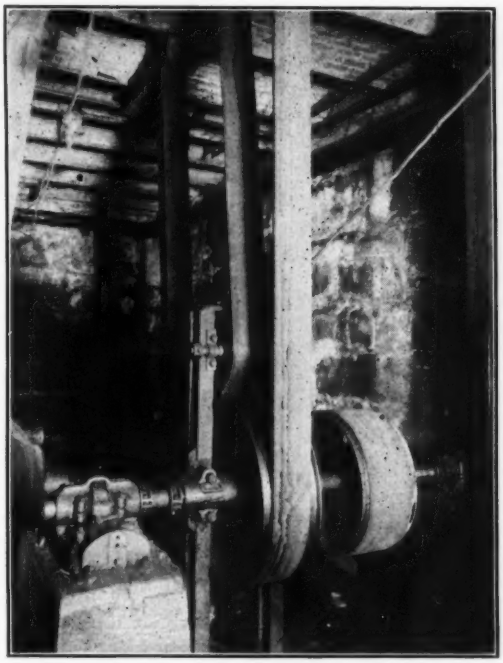
United States Rubber Co.



Courtesy: B. F. Goodrich Rubber Co.

FIG. 7.

No. 1 main drive at the Rialto Mill, Fox Paper Co., Lockland, Ohio.



Courtesy: B. F. Goodrich Rubber Co.

FIG. 6.

Winder drive at the Brown Island Mill, Albemarle Paper Mfg. Co.

In the first place, the tractive capacity of the transmission is high, owing to an excellent surface friction which grips contact arcs of very close to 180-degrees on both driver and driven pulleys, the slack of the belt being on the bottom; secondly, the speed of the belt, about 2,830 feet per minute, is an excellent one for the development of high tractive effort; and also because the internal friction developed by the flexure of the belt around the pulleys is decidedly low. An accepted rule for satisfactory flexibility of rubber belting at normal belt speeds is to allow at least 3 inches of pulley diameter for each ply thickness of belt. In this case, the allowance is a matter of 6½ inches at a highly advantageous belt speed, so insuring low internal friction and high tractive capacity.

Another interesting rubber belt drive is at the plant of the Hopper Paper Company, Taylorville, Ill., where a high-speed, twin engine drives the paper machine. Operating conditions are quite different here, the belt speed being nearly two and three-quarters times as great, and the driving belt, 18 inches wide of quite stiff 8-ply construction, has to grip the pulley tightly at the very considerable speed of 6,700 feet per minute. The particular belt installed appears to work quite satisfactorily, however, as evidenced by the decidedly low cost of this hard drive, the physical characteristics of the belt coordinating well with the physical conditions under which it has to operate.

At the paper mill of the Cherry-Burrell Corporation, Tama, Ia., 14-inch, 8-ply belts of heavy duck, friction surface, construction drive two Jordan engines from a common lineshaft in a most satisfactory manner. These belts are of more flexible constructon than the 18-inch belt at the Hopper Paper Company, and, despite their considerable thickness, grip the pulleys tightly and are especially adapted to service under moist atmospheric conditions. They are also said to be less affected by heat and cold than other belts, and again well exemplify the value of coordinating the physical properties of the belt with the physical conditions of service.

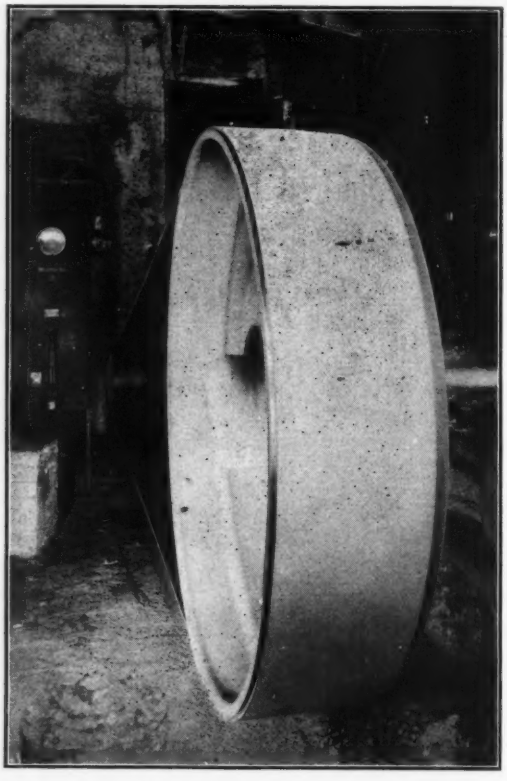
Flexibility Adds Traction to Rubber Belting

One of the most illuminating examples of the value of belt flexibility and reduced internal friction in securing high pulley traction is to be found in excellent service records made by rubber belts constructed without fold of fabric, such as were discussed in these columns July 26, 1928 and May 9, 1929. In these belts, the edges of the several fabric plies are not folded over as is customary in rubber belt construction, nor are selvage edged plies of fabric employed. Instead, the raw edges of the plies are simply squared up and protected with a sealing coating of a suitable rubber compound, or friction.

Four beaters in one room at the Riverside Mill of the Albemarle Paper Company, Richmond, Va., are driven by 20-inch, 7-ply belts of this type; one of which has been in service about three years, another two years, a third for some six months less, while the fourth was installed only comparatively recently. These are all endless belts, 25 feet 7½ inches long, and run at close to 2,000 feet per minute, being driven by 100-horsepower motors with 15-inch pulleys. To secure the necessary belt wrap about the relatively small motor pulleys and maintain suitable belt tension, swinging, weighted, snub idlers are employed, for which service these foldless rubber belts are well adapted, reverse flexure introducing no abnormal strains.

At the Browns Island Mill of the same company, an 8-inch, 8-ply endless belt, 34 feet 3 inches long, of the same type is employed for driving a winder. It was installed about two and a half years ago and is still running. The drive is a vertical one and prior to the installation of the foldless belt gave constant trouble, the average life of the other types of belts used being a matter of seven months, while the longest lived of these earlier belt drives gave out in nine months.

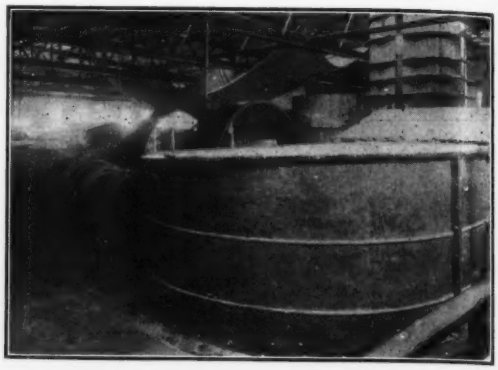
Comparable service records have also been made by similar belts at the Rialto Mill of the Fox Paper Company, Lockland,



Courtesy. B. F. Goodrich Rubber Co.

FIG. 8.

Beater drive at the Rialto Mill, Fox Paper Co.



Courtesy: F. L. Smidth & Co.

FIG. 9.

Snubbed beater drives at the plant of the Tonawanda Paper Co., Inc., North Tonawanda, N. Y.

O., where they are employed for the main drive and, at present, for one of the beater drives. In both instances, 16-inch, 7-ply endless belts are used driven by 16-inch motor pulleys, whereas with rubber belts of less flexibility and correspondingly greater internal friction the pulleys would have to be about 50 per cent greater diameter to secure satisfactory traction, imposing more pronounced belt strains, on account of the considerably stiffer belt construction, and aggravating belt deterioration.

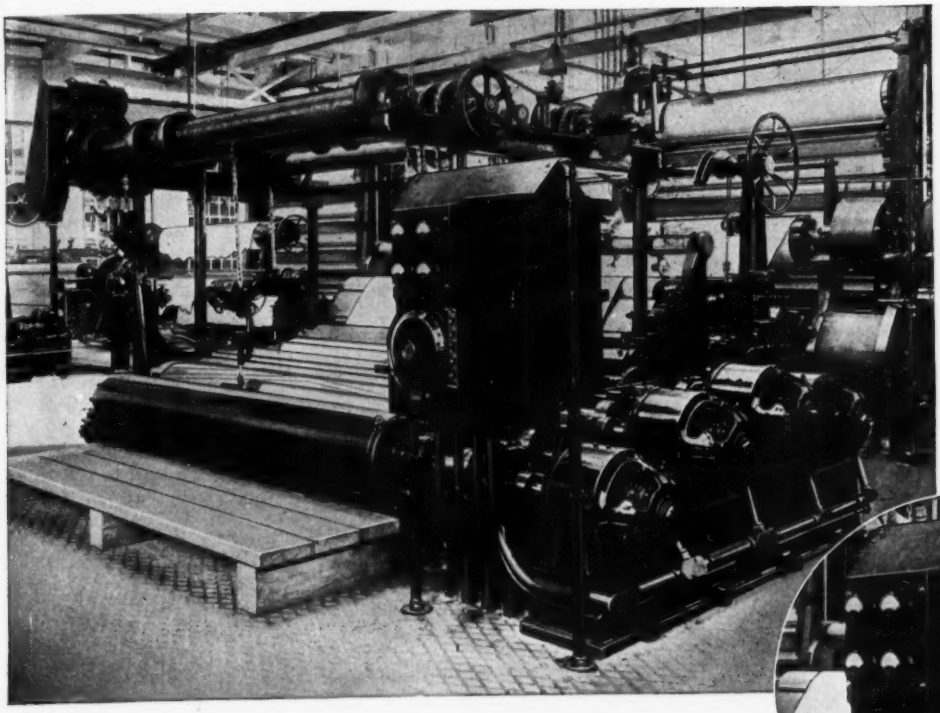
The main drive belt, 49 feet 4½ inches long, runs at the efficient speed of 2,430 feet per minute and after nearly five months of 24-hour operation, six days each week, shows no appreciable stretch. Both leather and other types of rubber belts previously used on this cylinder machine drive had to be taken-up each Sunday shutdown. The new belt, incidentally, cost $189.00.

The beater drive belt, 38 feet 4 inches long, has been in service a month longer, also operating on a 24-hour days schedule, six days a week, and has not yet had to be taken-up. It runs at 2,150 feet per minute, driven by a 75-horsepower motor, and cost $151.00. So satisfactory has the belt served, in fact, that the other beaters in the mill will be similarly equipped when their present belt drives fail.

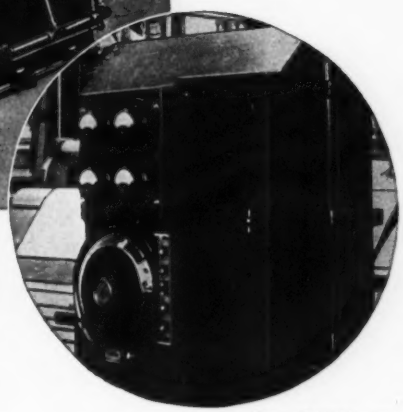
Snubbing to Increase Belt Traction

These beater drives are notoriously hard on the belts and quite frequently, particularly if floor space is at a premium or if clear passageways are required, the use of weighted, swinging, snub idlers; automatic belt contactors, or tighteners, as they are sometimes termed; is resorted to, to increase belt traction and conserve floor space. This was done for the four beaters at the Riverside Mill of the Albemarle Paper Company and the practice is quite general. It is undoubtedly highly efficacious, but it is very important to have the physical properties of the belt coordinate well with the physical conditions of the service. When a belt is used with such snubbers, the flexure of the belt is not only aggravated, but is reversed. That is, while the bending of the belt as it passes about the main pulleys is in one direction it is in the opposite direction as the belt passes the snub idler. This makes it imperative, for the best results, to employ a belt which bends about as readily in one direction as in the other.

It is customarily recommended that flexible double leather belting or equivalent fabric belting be employed for such drives and that preferably the belts should be made endless. The flexible, foldless, rubber belting, belts of which are quite usually made endless, should prove, consequently, particularly suitable for such drive service, as it bends with equal facility in either direction. In the case of leather belting, however, the belts should not only be of double thickness, but constructed in such manner as to withstand reverse flexure without excessively aggravating internal friction.



M & W Four Drum Winder with Electric Drive, in mill of West Virginia Pulp & Paper Co., Williamsburg, Pa.



One rheostat controls the speed of all four drums after they have been regulated to suit the grade of paper.

"SLIP" versus "CREEP"

TO wind a roll of paper snugly, it is only necessary that the second or "variable" drum shall exert a frictional pull sufficient to take up the slack that occurs as the paper goes on the roll.

In taking up that slack, a motor-driven drum merely "creeps" ahead of the roll; and that slight "creep" is all that is required. Excess *slip*, if it is permitted beyond the "creep" just mentioned, represents both wasted power and a tendency toward undue hardness as the size and weight of the rolls increase.

In M & W Four Drum Winders with Electric Drive, that waste of power is avoided, and with it the necessity for operative care and skill to prevent excessive hardness. This important advance in winding is due partly to the inherent flexibility of electric motor drive; but its successful application is due to the patented M & W system of drum control.

The M & W system is described in the new book on Four Drum Winders. It points the way to better operation at a vital point in papermaking. Shall we send a copy?

YES, we still build belt-driven Winders — and good ones! But we consider the Electric Drive a long step forward.

THE MOORE & WHITE COMPANY
Established 1885
15TH ST. & LEHIGH AVE. PHILADELPHIA, PA.

The belting experience with the beater drive at the Continental Paper Company, discussed in these columns July 26, 1928, is an excellent confirmation of just this point. The hard, 24-inch, duck belt with 12 plies bound together with a tenacious friction stood up some twenty-six times as long as the leather belts it replaced. The fabric belt was not particularly flexible, but it bent with equal ease in either direction, so that the reverse flexure introduced no particularly intensified strains and internal belt friction was kept within bounds. In the cases of the unsatisfactory leather belts, while their early failure may very probably be attributable in part to lack of suitable treatment for withstanding damage from the atmospheric conditions under which they had to operate the collapse was hastened, at least, by internal friction disintegration caused by reverse flexure. Such belt burning may have been due to faulty belt construction or to the fact that the texture of the leather had lost its pliability and had set.

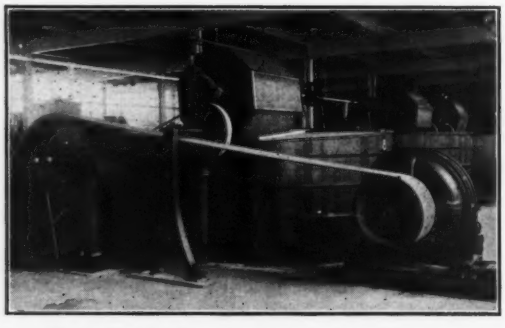
Higher Surface Friction Increases Belt Friction

Exceedingly high surface friction and quite low internal belt friction, a combination which develops marked tractive capacity and makes feasible short center drives without the need of snubbing flat belts, even at relatively high speed ratios, characterizes a comparatively new belt which has already won considerable favor among pulp and paper mills. Its construction is decidedly ingenious, consisting of a single or double leather or multiple ply Balata or rubber belt backing, to the pulley side of which are attached narrow, longitudinal strips of soft, green and pliable leather possessing a very high coefficient of surface friction.

These strips are riveted to the backing by hollow rivets, deeply clinched so as to form cup-like depressions in the soft leather strips and thus guard against the belt riding on the metal rivets and breaking the adhesive grip between the green leather strips and pulley surfaces. The leather or fabric backing carries all tension strains, while the air channels between the friction strips of soft, pliable contact material eliminate any possibility of air pockets forming between belt and pulley, even at such high belt speeds as 7,000 or 8,000 feet per minute.

This distinctive construction makes it possible for the belts, made endless so far as possible, to operate on short pulley centers and high speed ratios at efficiencies bettering 98 per cent. On long centers, the belts operate without any appreciable slip and very little passive resistance, such as internal friction, has to be overcome. The backing not only carries all the tension strain, but being relatively thin and separated from the pulley surface at all times by the thickness of the friction strips a minimum of internal friction due to flexure is developed. This absence of any appreciable amount of internal friction is particularly advantageous in short center drives, in which the toll of internal belt friction is customarily much aggravated.

It is this particularly type of belting which is used to drive



Courtesy: Alexander Bros., Inc.

FIG. 10.

150-horsepower beater drive, employing high friction surface, 16-inch belt.—Taggart-Oswego Paper & Bag Corp., Oswego, N. Y.

Courtesy: Alexander Bros., Inc.

FIG. 11.

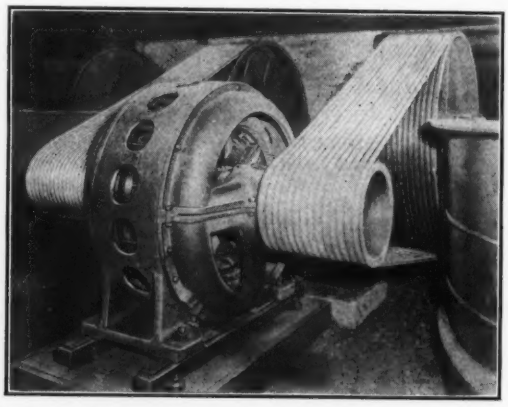
Beater drive at Green Island Mill, John A. Manning Paper Co., Inc., Troy, N. Y.

the 150-horsepower beaters at the plant of the Taggart-Oswego Paper and Bag Corporation, Oswego, N. Y., with outstanding satisfaction. These particular driving belts are 16 inches wide and operate on 16-foot centers at a speed ratio of 2.6 to 1. A similar application, made in 1928, is at the Green Island Mill of the John A. Manning Paper Company, Inc., Troy, N. Y., where a 16-inch belt, operating on centers of approximately 12 feet and at a speed ratio of 3 to 1, drives a beater and has required little or no adjustment.

"V" Belts Double Effective Belt Contact

A radically different method of securing increased belt traction and short center drives possessing an efficiency of 98.9 per cent at full load is to employ endless "V" belts running in individual, conforming grooves on driving and driven sheaves. By this expedient, the belts being triangular in cross-section, the tractive grip of the belts, several belts usually constituting a drive set, is greatly increased, compared with that of flat belts of like width, by reason of the much greater surface contact secured, the sloping sides of the belts contacting, and by the resulting wedge effect which combats belt slip.

Twelve 1¼ x ¾ inch "V" belts are comparable in strength to a 12-inch, 10-ply, 36-ounce rubber belt and such a multi-strand belt running on 40-degree "V" grooved, cast iron sheaves offers three times the resistance to slip than the heavy flat rubber belt of equal strength running on crown face cast iron pulleys. In the case of the flat belt, the coefficient of friction, determined by test at the Carnegie Institute of Technology, is 0.50 and that of the "V" belt 1.50, inclusive of the wedge effect of the "V" belt. Furthermore, while the flat rubber belt would require a minimum pulley diameter of 36 inches for satisfactory operation, the "V" belt can be run with like efficiency on a 12-inch pitch diameter sheave.



Courtesy: Allis-Chalmers Mfg. Co.

FIG. 12.

Direct V belt beater drives from 250-horsepower, double ended, motor.—Philip Carey Mfg. Co., Lockland, Ohio.

Pep Up Your Old Equipment To Meet The Modern Tempo

If you're trying to meet the modern "fox trot" production tempo with "minuet" machinery, it's time to do one of two things. Replace your equipment . . . or rebuild it.

We can help you, either way. Supply you with new material, all the way from a gear key to the largest Fourdrinier you can conceive—or find and eliminate the lameness in your present equipment.

A lot of mills credit us with pulling them back to the profit side of the ledger merely by repairing, replacing or rebuilding worn or antiquated machinery or parts.

A leak in your production might be traceable directly to some similar condition — and as easily cured. At any rate, it's worth considering — let's talk it over.

We'd like to tell you more about it—write us

The Bagley & Sewall Co.

Watertown, N. Y.

One of the first applications of these "V" belt drives, made in 1926, was to drive a beater at the Lockland, O., paper mill of the Philip Carey Manufacturing Company. This drive has been in continuous service and is still running. Many other of these distinctive have since been installed for various drive services in that same mill and today there are close to fifty of these transmissions handling an aggregate load of very nearly 3,000 horsepower. The Kimberly-Clark Company, Neenah, Wis., now employs more than three hundred such drives, the National Paper Products Company, Port Townsend, Wash., close to a hundred, while dozens of other pulp and paper mills have installed from six or seven to many times such numbers, the two mills specifically mentioned having each an aggregate "V" belt driven load of well over 4,500 horsepower.

Another of the paper mills to install such drives for beater service while they were still quite novel reported, after 10,000 hours continuous service on six beaters, that inspection showed no signs of wear or belt deterioration. Still another paper mill pioneer in the use of such drives operated beaters for nearly three years on one set of "V" belts. Since these early installations were made, the drive has been applied to virtually every kind of transmission service, to run a wide variety of machines, and in almost every case has functioned creditably. So much so, in fact, that there would appear no need for further discussion of the excellent belt, already familiar to almost all progressive mills.

Development in "V" Belt Drive

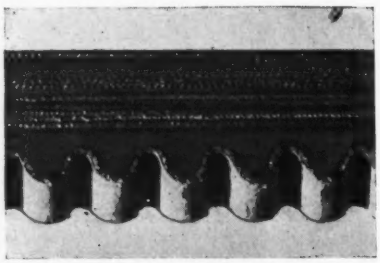
The success of the "V" belt drive is attributable primarily to the increased contact surface secured between the belt and the driving and driven sheaves, resulting in several fold greater resistance to slip and permitting much shorter-center drives to be employed, or, in other words, to greatly increased surface friction. In its now more familiar form of uniform triangular cross-section, however, the second requisite for the most efficient of belt transmissions, and that which controls the deterioration of belting by "burning," is not greatly modified. There is no decrease in internal belt friction. In fact, by reason of the proportionally great thickness of the belt, as compared with the width of the individual strand, the internal friction developed by belt flexure is greater, rather than less, than is developed in an ordinary flat belt under similar bending strains. On this account, a comparatively recent development, or modification, in "V" belt drive construction is of particular interest.

In this modified form, the belt, instead of being uniform in cross-section, with its inner and outer surfaces parallel, has

Courtesy: Allis-Chalmers Mfg. Co.

FIG. 13.

75-horsepower V belt beater drives, Flambeau Paper Co., Park Falls, Wis.



Courtesy: Dayton Rubber Mfg. Co.

FIG. 15.

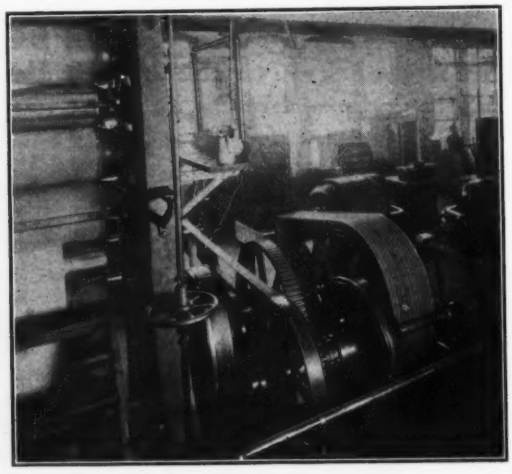
Section of cogged surface V belt.

its narrower inner surface indented with a series of tooth-shaped corrugations. This distinctive "cogged" section serves, not to aid in the transmission of power, but to control the buckling of the belt s contact surfaces, while the transmission is flexed about the sheaves. The elimination of contact surface buckling, distinctive of this modified "V" belt construction, can readily be observed by bending a length of the belting nearly double and noting the evenness of the sloping contact surfaces.

As this "cog" belt flexes and conforms to the curvature of the sheave, the corrugations on the inner section adjust themselves without strain, lateral distortion or any tendency to stick in the sheave groove, since the compression stresses are effectively relieved by the corrugated construction. The sides of the belt's compression section, consequently, conform with the sloping sides of the sheave groove at all times.

The mid, or neutral, section of the belt, subjected to neither compression or tension stresses introduced by flexure, is "pre-stretched" during manufacture, so that the belt will not elongate under service strain and mar the evenness of its contact surfaces. The outer portion of the belt, being under tension when passing around the sheaves, is constructed, however, so that it can elongate as required without introducing undue internal belt strain. This tension section of the belt is made, moreover, so that it presents a tough, wear-resisting riding surface with a particularly high coefficient of surface friction.

A further refinement, to insure adequate contact pressure on the tension section, consists of making the inclination of the sides of the belt a trifle less steep than that of the sides of the sheave groove. That is, the included angle of the belt is made just a little greater than the included angle of the groove.



Courtesy: Allis-Chalmers Mfg. Co.

FIG. 14.

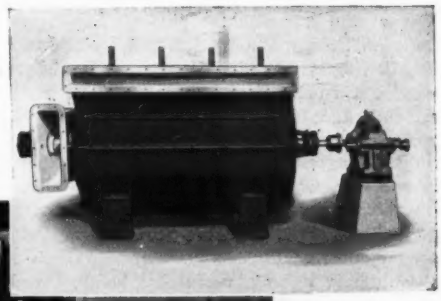
75-horsepower V belt drive on No. 2 super-calenders, Watervliet Paper Co., Watervliet, Mich.

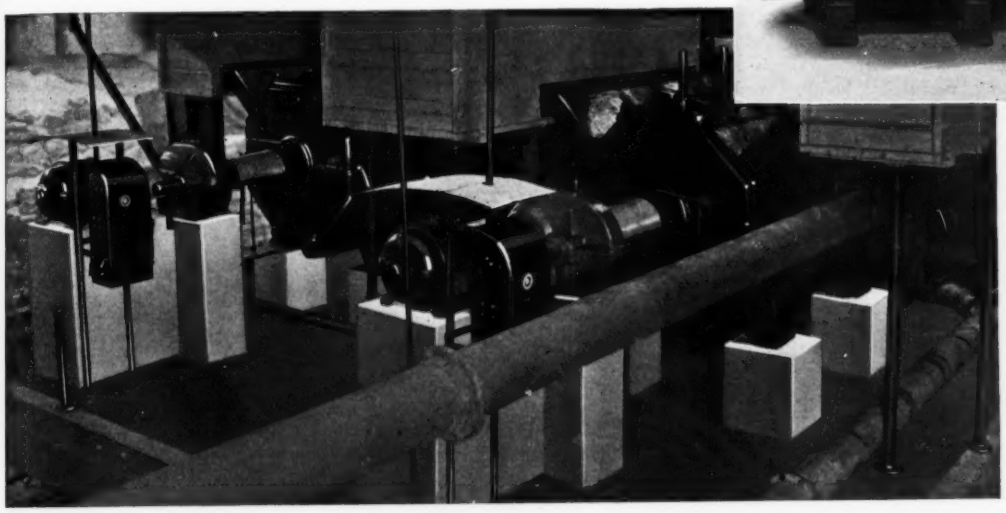
TO THOSE WHO SAID—"WE'LL WAIT and SEE"

IF you were among those who said "we'll wait and see" when the Valley-Thune Rotary Screen was first introduced . . .

The time has come for *action*.

Because this machine has already, in 14 installations, thoroughly demonstrated its ability to screen sulphite or sulphate pulp comparable to flat screens. In addition to being able to screen pulp consistently *clean*—it offers the inherent advantages of extremely lower maintenance . . . noiseless operation . . . no overflow or leakage . . . less floor space . . . doubled capacity . . . and low power requirement.





If you have been waiting to see what results the Valley-Thune Screen would achieve, we have plenty of facts from present installations to prove to you that this rotary screen has successfully solved the problem of producing *clean* pulp.

An inquiry, addressed to the Valley Iron Works Co., Appleton, Wisconsin, will bring whatever information you desire to you.

OTHER VALLEY EQUIPMENT

- Jordan Engines
- Beaters, Breakers, Bleachers & Washers
- Flat and Rotary Screens
- Screw Presses
- Voith High Pressure Stock Inlets
- Centrifugal and Stuff Pumps
- Laboratory Equipment
- Stock Valves—Gate and Plug
- Stock Consistency Regulator
- Special Machinery

VALLEY

Equipment for Paper and Pulp Mills

New York Office: 350 Madison Ave.
Western Mfg. & Sales Div.: Smith & Valley Iron Works, Portland, Ore.
Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

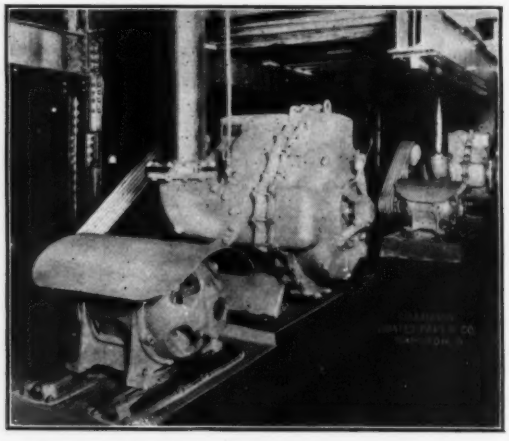
The difference is so slight, however, that it introduces no faulty disturbance in the intimacy of belt and sheave contact. On the contrary, any effect tends to make the contact more effective in respect to tractive capacity, for any reduction in contact pressure occurs at the compression, or corrugated, section of the belt where the tractive effort is at a minimum and any increase in contact pressure occurs at the tension section where the tractive effort is at a maximum. Any slight differential in contact pressure, consequently, serves actually to increase the resistance of the belt to slip.

Much care has quite evidently been exercised in the development of this belt, to coordinate the physical construction and properties of the belt with the physical conditions of service, and many of the constructional details are of particular interest. A sturdy driving belt of marked efficiency has been produced which possesses unusual resistance to slip, high tractive capacity and great endurance (long life) and one which is especially adaptable for use on very short center drives. Furthermore, it has already distinguished itself in paper mill services.

In one mill, where these belts were installed two years ago for severe beater drive service, the belts have been examined recently for signs of possible deterioration and no evidence of any wear could be discovered. All indications were that these belts still have a long, useful life before them. Incidentally, the belts have not been accorded the consideration anticipated at the time they were installed. Then, the beater load was a matter of 75-horsepower and the belts were proportioned for such service. Subsequently, the beater load was elevated 33 1/3 per cent and the drives have had to carry this increased load almost continuously for two years.

The suitability of the belt for use on short center drives is well shown in the view of two of five 75-horsepower vacuum pumps arranged along the aisle of the building at the Champion Coated Paper Company's mill at Hamilton, O. Prior to the installation of these short center drives, the pumps had been driven by flat belts over pulleys operated on centers of from 15 to 20 feet, necessitating the placing of the driving motor for each pump almost against the pump ahead and, by so doing, closing-off the passageways between the several pumps.

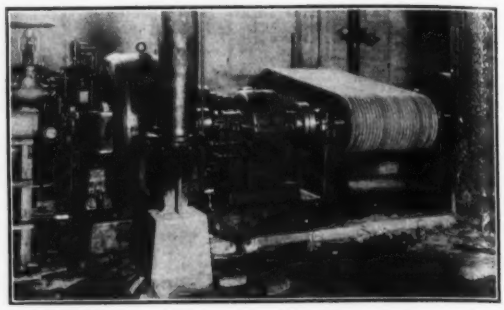
The third installation view of these "cog" belt drives shows a 500-horsepower drive from a steam turbine to a paper machine lineshaft, one of the largest of these distinctive belt drives in service at the present time. It consists of a set of twenty-six individual belts, 1 19/32 inches in width and 1 inch thick, running on sheaves of approximately 25- and 35-inch diameter. The belts are approximately 20 feet in length, the total face width of the sheaves being about 4 feet, and no provision is made for drive adjustment. Both the steam turbine and the lineshaft are fixed as to position, so no take-up of belt is permissible. The drive was made feasible, hence, only by virtue of the non-stretching characteristic of the belting.



Courtesy: Dayton Rubber Mfg. Co.

FIG. 17.

Compact arrangement of vacuum pump direct belt drives.



Courtesy: Dayton Rubber Mfg. Co.

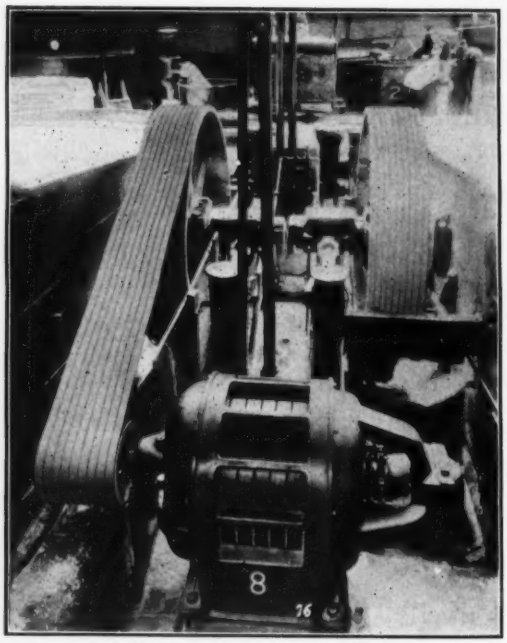
FIG. 18.

500-horsepower special V belt drive from main turbine to paper machine lineshaft.

These few examples of successful drive belt applications and the comments on developments in driving belt transmissions have been presented simply to impress upon the users of power belts the need and value of intelligent investigations in respect to the physical construction and properties of various types of belting, and of exercising good judgment in selecting only the type best suited to the individual application. Most belt complaints are attributable to misapplication, an error avoided only when the physical construction and properties of the belt coordinate with the physical conditions of the service.

Empire Paper Co. Damaged by Fire

ALBANY, N. Y., June 23, 1930.—Considerable damage was done to the plant of the Empire Paper Company this week when fire broke out in a shed on Gansevoort St. Norman Nachinson and his brother, Nathan, partners in the concern, were both felled by a live wire and are now recovering in the Memorial Hospital.



Courtesy: Dayton Rubber Mfg. Co.

FIG. 16.

75-horsepower cog belt drive on beater.

LOCKWOOD'S DIRECTORY

OF THE PAPER AND ALLIED TRADES

1930 EDITION

CORRECTED UP-TO-DATE

CONTENTS

Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

City Addresses of Mills and Mill Supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufacturers
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
Paper Bag Manufacturers
Paper Box Manufacturers
Paper, Wood Pulp and Chemical Fiber Mills of the United States, Canada, Cuba, Mexico and South America
Paper Specialties Manufacturers
Papeterie Manufacturers
Prepared Roofing Manufacturers
Rags and Paper Stock Consumed by the Paper Mills
Stationers in United States, Porto Rico, Canada, Cuba, Hawaiian Islands and the Philippine Islands
Statistical Table of Mills
Tablet Manufacturers
Tag Manufacturers
Toilet Paper Manufacturers
Trade Associations
Twine Manufacturers
Vegetable Parchment Manufacturers
Wall Paper Printers
Water Marks and Brands
Waxed Paper Manufacturers

1,000 PAGES
of USEFUL INFORMATION

Traveler's Special Pocket Edition

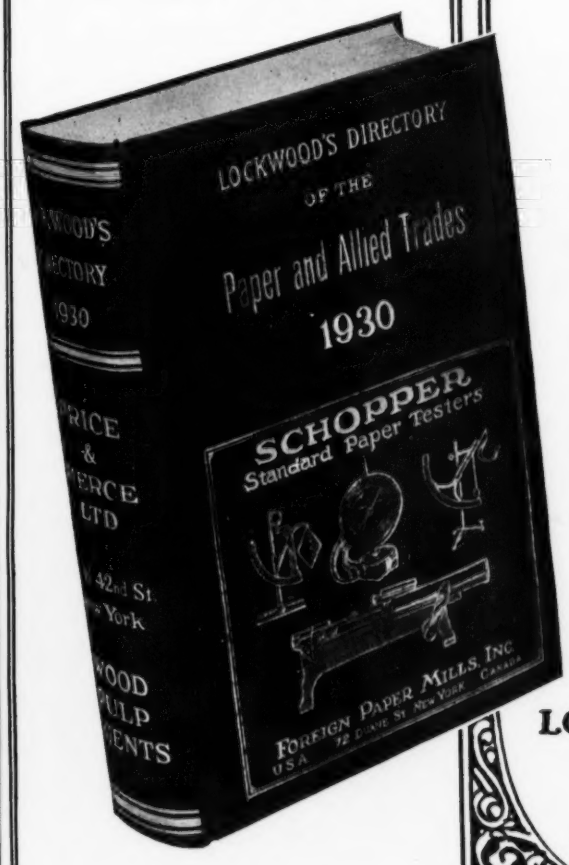
bound in a flexible cover for use of traveling men, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order.)

Published by
LOCKWOOD TRADE JOURNAL CO.
10 East 39th Street
New York, N.Y., U.S.A.

The OLDEST INDUSTRIAL DIRECTORY in the United States

NOW READY FOR DELIVERY

Price $7.50



The 55th Consecutive ~ Annual Issue ~

PAPER TRADE JOURNAL
ESTABLISHED 1872

10 East 39th St., New York

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.,
Power Engineering Consultant

Price, Per Copy, 10 Cents
United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member A. B. C. Audit Bureau of Circulations

Vol. XC New York, June 26, 1930 No. 26

THE NEW PAPER TARIFF

The American Paper and Pulp Association is to be congratulated on the part it played in shaping the paper sections of the new tariff act which was signed last week by President Hoover. The association has just issued in pamphlet form the text of the new act compared with the act of 1922 and explanations of changes made in schedules affecting paper.

In a foreword to the pamphlet Mr. Milton E. Marcuse, chairman of the general tariff committee of the association, says in part: "At the outset it was foreseen that the matter was likely to be prolonged, but we believe we are safe in saying that none foresaw the course which the Revision and its ramifications were to take. The wise policy adopted at the beginning has stood us in good stead during the nearly one and one-half years. That policy was to present facts, and facts alone, and to ask for only such changes as the facts justified. We here quote from our brief filed February 13, 1929,—

"'It is not the intent or purpose of the industry to seek from The Congress either classification or rates which will absolutely prevent the importation of competitive products, nor to ask for protection where no protection is needed. This Industry can justify by facts every change which it seeks.'

"It is pertinent here to quote another paragraph from the same brief:

"'Some four and one-half years ago this Industry organized what is known as the Import Committee of the American Paper Industry. That organization employs a staff of skilled experts. One of its functions has been cooperating with the Government in securing the proper enforcement of the Tariff Act. It has investigated and digested during its existence nearly 4,000 cases in which there was reason to suspect undervaluation, misclassification or dumping of foreign paper.

"'This study shows that various changes in both rates and phraseology are vitally necessary if the American manufacturer is to be given an equal chance in the American market with the foreign producer. The present Act is indefinite in many of its classifications of paper.'

"The investigations and work of the Import Committee had disclosed that proper phraseology was as important as rates. So in the Industry's brief each paragraph of the Paper Schedule was presented in language designed to express clearly the Legislative intent and thereby prevent misclassification. We call attention under the paragraphs hereinafter set forth to the results obtained.

"The brief was filed on February 13, 1929, and copies were sent to the Industry. The needs of the Industry were forcefully presented by the President of the Association, Mr. Everest, who was ably supported by the group spokesman. At the conclusion of this presentation the Chairman of the Committee on Ways and Means stated that the Paper Industry had made the best presentation which the Committee had heard up to that time. We are inclined to feel that this impression prevailed at the conclusion of all the hearings.

"As the Bill progressed before the Committees of Congress further presentations were made by President S. L. Willson, your Tariff Committee, and group representatives. Three reports have been made to you indicating the results with respect to rates. This report will conclude the work of this Committee—the work of Tariff enforcement will be continued by the Import Committee.

"May I be permitted a personal word—I have taken some part in the making of several previous tariffs, but never, in my opinion, has the American Paper and Pulp Association, and the Industry as a whole, done a better piece of work than in this just concluded Tariff Revision. Our needs have been urged openly, persistently, and in such a manner as to merit and receive approval rather than criticism.

"In spite of the early suggestion that this was to be a limited and scientific revision, I have never known a proposed tariff to be subjected to more intense politics. This affected practically all industries and all schedules. If there was any conspicuous exception, it was the Paper Industry which, at the outset, had determined to avoid politics and present its needs solely on the basis of facts. Through the entire course of the proceedings in Congress, our Industry has maintained the dignity with which it first approached the tariff problem. The results have fully justified our work and the manner in which it has been performed."

---

18 CENTURIES OF PAPERMAKING

Thet PAPER TRADE JOURNAL is pleased to announce another outstanding book relating to the romance of papermaking, by Dard Hunter. Papermaking Through Eighteen Centuries is the title of the handsome 358 page volume published by William Edwin Rudge of New York. The use of beautiful typography and Worthy paper gives it an atmosphere of quality that is harmonious with the thesis itself.

As stated in the preface this book, while it is in no sense a reprint of any former work, has been compiled because of the interest shown in Old Papermaking issued in limited form in 1923. Since the demand was much greater than the supply of two hundred copies, many students of printing and papermaking, as well as many bibliophiles, were unable to procure copies. The present book deals with the same phase of papermaking but in a more comprehensive manner than the old work; not only is

it issued in a larger edition than was possible in the private press items, but it contains additional text and a greater variety of illustrative materials.

The aim of the book is to give its readers an insight into the methods used by old makers of paper, especially after the introduction of printing from movable types, and to interest the etcher, the engraver and the printer as well as those engaged in the paper and watermarking trades. It is the most comprehensive work that has yet been issued on this particular phase of papermaking.

Dard Hunter, the author, is well known by name to the paper industry. His point of view is essentially of the artist and ancient craftsman rather than of the present day industrialist. Machine widths and speed of operation are factors of no consequence in his estimation. Twenty-five years ago he began his journeys through Europe to learn the finest detail, the methods employed in the manufacture of handmade papers, the design of equipment for carrying on the work and the manufacture of type. These studies led him to study the earliest methods of making paper and in the first chapter of this new book is contained the story of papermaking from the days of Ulmer Stromer, in 1390, to Matthias Koops in 1801.

Chapter II is devoted to an intimate review of the old appliances and methods of papermaking. Of particular interest is the large number of illustrative plates showing the vats, moulds, presses, couches, beaters, drying lofts, sizing equipment, glazing hammers, etc. In concluding the chapter, the author states that every appliance of a modern handmade paper mill can be traced to its Oriental origin.

Chapter III relates to the development in the maceration of papermaking materials from the ancient Chinese methods to the invention of the hollander. The hand operated mortar and pestle was followed by the hydraulically operated stamping mill which in turn was eventually followed by the hollander. However, this evolution was slow and no revolutionary changes entered to suddenly change the art until the Fourdrinier was invented.

Chaper IV takes up the invention and evolution of the papermaking mould which was the principal tool of the ancient papermakers. The Oriental moulds were largely made of bamboo whereas the European moulds were made of wood frames and wire cloth. Into the moulds were woven the watermarks showing the craftsmen's marks.

Other chapters deal with the eccentricities of the old papermakers and the characteristics of the paper they fabricated. One chapter gives an account of the first English forgeries and the efforts of Sir William Congreve to prevent counterfeiting. The latter invented a sheet of three laminations, the middle sheet being colored and having a design that could be seen when held up to the light. The last chapter gives a very comprehensive review of the use and significance of the ancient watermarks in European and American book and manuscript papers.

No one interested in the manufacture of paper should fail to obtain a copy of Dard Hunter's Papermaking—Through Eighteen Centuries, which is a real classic and although somewhat more expensive than the ordinary textbooks is well worth its price, particularly in view of the fact that the issue is not large and will be exhausted all too soon. Under similar conditions many of the previous works of the author have enhanced greatly in value and are now selling at a premium. Copies of this book may be obtained from the Technical Association of the Pulp and Paper Industry, 18 East 41st Street, New York, at $17.50 per copy.

Ticonderoga Reorganizing

[FROM OUR REGULAR CORRESPONDENT]

TICONDEROGA, N. Y., June 23, 1930.—A complete reorganization of the Ticonderoga Pulp and Paper Company has been effected because of existing market conditions. A few of the workers have been laid off and under the new system the day workers will be employed eight hours instead of nine as has been customary. All machines at the plant are operating on steady schedules and no further reductions in the working force will be made. Rumors that the company planned to dispose of sections of the property to competitors have been denied and present indications are that the entire plant will be running at full capacity within a few weeks.

Thomas E. Warren has tendered his resignation as general manager to become effective July 1. He entered the employ of the firm many years ago and gradually worked his way up until fourteen years ago he was made general manager. He is regarded as an authority on all matters pertaining to the paper industry. It was announced that he would be succeeded by Charles A. Hunt, who has occupied the position of office superintendent for many years.

I. P. Co. Gets Pulp at Port of Albany

[FROM OUR REGULAR CORRESPONDENT]

CORINTH, N. Y., June 23, 1930.—Another cargo of wood pulp reached the Albany port terminal this week when the Steamship Jan docked with 1,800 tons for the mills of the International Paper Company in this section. The trip was made from Nova Scotia in record breaking time and long strings of freight cars were awaiting its arrival. With the arrival of the Jan it was learned that a second shipping company has sponsored ship movements to the Port of Albany. The Jan is under charter by the Polarus Shipping Corporation, of New York.

It was also announced that a third vessel, the S.S. Lifland will dock at Albany late next week with a cargo of pulp from Chatham, N. B. The plans of International call for six ocean ships to dock at the terminal this month carrying cargoes for the Northern New York mills.

Kalamazoo Cost and Technical Men To Meet

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., June 23, 1930.—The Cost and Technical Association of the Paper Industry, Kalamazoo Valley division, is planning on a golf tournament for the summer months, with final play in September. It is proposed that preliminary play be carried on during June, July and August and from the cards turned in at those contests, it will be possible to arrive at a handicap for the finals in September.

The next meeting of the association will be held Thursday afternoon and evening, June 26, at the Otwellegan Club. There will be opportunity for golf in the late afternoon, dinner being served at 8 p. m. Frank Brown and Paul Torre are the speakers. The former will speak on "Planning and Budgeting Future Sales Costs." Torre will speak on "Drying of Paper."

Waterfalls Paper Mill Leases Plant

Elliott Rogers, president of the Rogers Fibre Company of Kennebunk has announced that the Waterfalls Paper Mill of Mechanic Falls had leased the Rogers company paper mill at Hacketts Mills, Poland. Thirty-five men are employed.

STRONG FOUNDATIONS

Enable Mathieson To Render Better Service To Industry

By CARL R. MILLER

No. 3 in a series of advertisements describing the position of The Mathieson Alkali Works in the Chemical Industry

ONLY the strongest foundations could have fostered the steady development which has characterized the progress of the Mathieson organization.

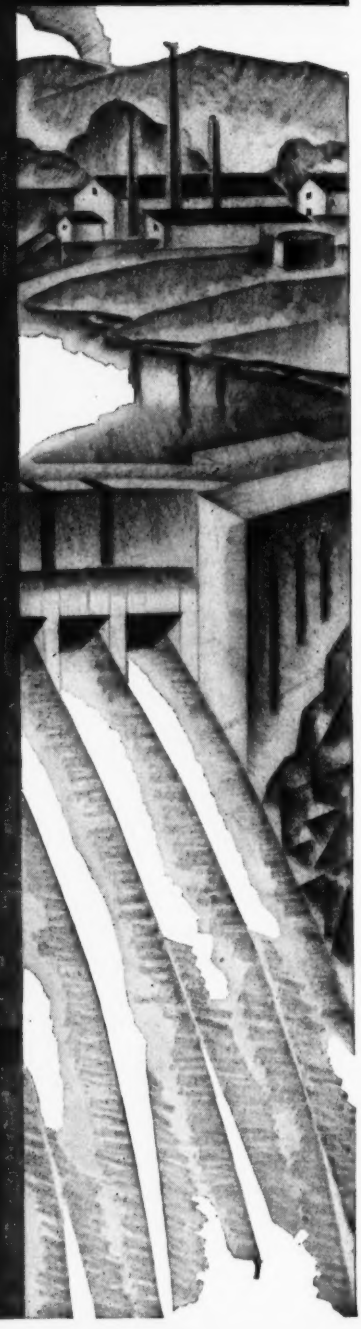
Consistently...year after year...Mathieson has built on bedrock foundations...has built with foresight and efficiency, seasoned with knowledge and experience. Each year new phases of an extensive development program have been introduced...larger plants erected...new products perfected...new processes inaugurated to insure greater manufacturing economies.

This constant development built on Mathieson's strong foundations of Resources, Research and Service guarantees purchasers highest value, uniformity and quality—not only now but in years to come. A list of available literature describing the various uses of Mathieson Chemicals will be gladly sent on request.

The MATHIESON ALKALI WORKS *(Inc.)*
250 PARK AVENUE NEW YORK, N. Y.
Philadelphia — Chicago — Providence — Charlotte — Cincinnati
Works: Niagara Falls, N. Y.—Saltville, Va.
Warehouse Stocks at all Distributing Centers

MATHIESON CHEMICALS

Soda Ash . . . Caustic Soda . . . Bicarbonate of Soda . . . Liquid Chlorine . . . HTH (Hypochlorite) . . . Ammonia, Anhydrous and Aqua . . . Bleaching Powder . . . Sulphur Dichloride . . . PURITE (Fused Soda Ash)



Great Structures Rest on Strong Foundations
SERVICE
RESOURCES | RESEARCH

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Manufacture of Liquid Sulphur Dioxide and Its Use In the Pulp and Paper Industry*

By R. Leonard Hasche[1]

The manufacture of liquid sulphur dioxide in the United States is now confined to several small producers scattered over the country. There are three or four plants on the Atlantic Seaboard, one in the Middle West and another on the West Coast. The daily production at the individual plants is small, probably not exceeding eight tons per day on the average at the largest plant.

According to information available all of the producers operating in this country are burning sulphur for their source of sulphur dioxide. Various attempts have been made during the past few years to recover liquid sulphur dioxide from byproduct or waste gases, i.e., from roasters, pyrite burners or converters. However, without exception, the practice has been abandoned, the plants either having been closed down or they have changed over to sulphur burners. There are various reasons for the failure of the plants to operate successfully on byproduct gases. The chief trouble can probably be laid at the door of the process used for the recovery of liquid sulphur dioxide from the gaseous mixture.

The water absorption process has been universally used in this country and abroad. Various modifications are found in the several plants, but it is essentially the old German process of Hänisch and Schröder, first used in 1885. It consists of separating the SO_2 from the other components of the gaseous mixture by absorption in water, yielding a sulphurous acid liquor of varying concentration, depending upon the partial pressure of the SO_2 in the gas and upon the temperature of the absorbing water. The SO_2 is expelled from the liquor by heating the latter to near the boiling point of water or by a combination of heat and partial vacuum. The gas liberated from the liquor is substantially pure and after being dried with sulphuric acid or calcium chloride is compressed to about 80 pounds and the liquid condensed in coils surrounded by cooling water.

Inherent in the process are weaknesses which make it impracticable to operate economically on a gas low in sulphur dioxide or of the fluctuating character which often obtains when using byproduct gases. By a gas low in sulphur dioxide we mean one which runs about 7 per cent SO_2 by volume. Such a gas strength is about the maximum obtainable from a roaster operating on zinc or copper concentrates or the average from a copper converter. The burning of iron pyrites gives a richer gas but adds a cost for raw material and we are, therefore, not classifying that as a source of byproduct gases. The effect of strength of a gas in SO_2 upon its solubility in water is well known to all familiar with operation of a bisulphite pulp mill. Whereas, with a gas of 15 to 17 per cent, from sulphur burners, a liquor can be obtained running from 1.75 to 2.75 per cent free acid, with a 7 per cent gas a solubility of free SO_2 in water of only about 0.8 per cent is obtainable. Thus, it is quite apparent that enormous quantities of water and, consequently, steam—for process heating—will be required when the water absorption process is operated on a lean gas. Approximately 128 tons of water would have to be circulated and heated to boiling for the recovery of 1 ton of sulphur dioxide.

Economies

As a consequence of the poor economy of the water absorption process for the manufacture of liquid SO_2, when operating on either byproduct gases or on a richer source, namely, from sulphur burners, an expensive product is given to the trade. The lowest price quoted for the compressed gas in ton lots is $60.00 per ton, to the oil industry. It is now being used by them in the Edeleanu Process of refining western crudes. In 150 pound cylinders it is currently quoted at 7 to 8 cents per pound for the technical grade, while for the ultra-dry product, free from oil and non-condensible gases, the refrigeration trade pays as much as 18 cents per pound and retails it to the private consumer at about 60 cents per pound. Thus, the present high cost of liquid SO_2 prohibits its use in many fields where it possesses great advantages over the product from the burning of sulphur. To enter these very large fields requires the reduction in cost to the consumer to much nearer the equivalent sulphur price.

The manufacturers of paper pulp by the bisulphite process come into consideration as the largest possible users of liquid sulphur dioxide in competition with the burning of sulphur. It would be presumption on the part of the writer to impress upon the minds of members of the pulp and paper industry the magnitude of the consumption by the bisulphite mills in the United States and Canada. The daily consumption is approximately 750 tons of sulphur, or equivalent to 1,500 tons of liquid sulphur dioxide.

The company which I represent has for some time past been considering the possibility of producing sulphur dioxide for the pulp mills in the Puget Sound district. In 1919 a 20 ton per day plant was built at Tacoma to operate on the water absorption process. The plant was in production for several months but costs were too high to warrant continuance of operation. The gas supply from the copper converters was sufficient for a plant considerably larger in size, and as originally planned it was to be a forerunner of a larger plant of capacity to supply two bisulphite mills with their whole requirement or several mills with a portion of the sulphur in equivalent liquid SO_2.

* Presented at the meeting of the Pacific Section of TAPPI, Longview, Wash., April 5, 1930.

[1] Chem. engineer, Research Dept. of the American Smelting & Refining Co., Tacoma, Wash.

In 1927 the problem of working out a process of more economy than the existing one, was turned over to our research department. The problem in all of its ramifications was a difficult one. Of first consideration was the gas supply. Converters are the only source of SO_2 gas at a copper smelter, of a sufficiently high concentration to consider. Yet the operation of the converters is very intermittent and the resultant gas very fluctuating in strength. Since the gas supply was not a steady one nor one of uniform strength any process developed must be sufficiently flexible to provide for these variable conditions.

Investigation of Solvents

The second problem was to devise a cheaper concentration and liquefaction process than the absorption one in common use. In the first investigations attempts were made to find a better absorbent for sulphur dioxide than water. Several organic solvents offered promise. Among the cheaper ones was tar oil, consisting essentially of toluene and xylene with about 5 per cent of tar acids. Several patents were found in literature which specified the use of tar oil for the purpose. Absorption experiments, however, revealed that while tar oil was an excellent solvent for pure SO_2, it had very little advantage over water when used with dilute air mixtures. The mistake of taking the solubility of a pure gas in a solvent as a criterion of what is to be expected from a mixture of the absorbable gas in inert gases is a very common one. We know that according to Henry's law the solubility of a gas in a liquid or solid absorbent is proportional to its partial pressure in the gas. Yet, as is well known, the proportionality is not always a straight line function. If we plot per cent of SO_2 by volume in the gas mixture as the abscissa against per cent absorbed by weight as the ordinate, we obtain with water and most of the fixed oils either straight lines or slightly convex curves, while with tar oil and solvent naphtha a very concave curve results. In fact the two latter solvents are poorer than water with a 7 to 50 per cent gas.

Glacial acetic acid and various ketones proved to be excellent solvents for a 10 per cent SO_2, but their physical characteristics as well as their high costs eliminated them from consideration.

Adsorption

Our attention was next drawn to recently developed solid adsorbents, more particularly to silica gel and activated charcoal. Weight for weight silica gel adsorbs from a 10 per cent gas 11 times and charcoal 23 times as much SO_2 as does water. It may be of interest to explain the mechanism of this so-called adsorption as contrasted with absorption, which we have to deal with when a gas dissolves in a liquid solvent. In the case of absorption in liquids there is usually some chemical reaction associated with the physical absorption. A solid adsorbent such as silica gel or activated charcoal has a sub-microscopic structure capillary in nature. We know that the vapor pressure of a liquid at a given temperature is greatly reduced when contained in capillary tubes. Now the capillary pores of silica gel, for instance, are of the order of a few millionths of a millimeter in diameter; hence it is possible to condense a gas to a liquid in the gel at a temperature greatly above its liquefaction temperature at atmospheric pressure. Thus we have an explanation of how a solid absorbent can take up such a large weight of gas per unit volume, for we have an actual liquefaction within the pore space. This is further borne out by the fact that the heat of adsorption is large, of the order of magnitude of the heat of vaporization.

The use of one or the other of these solid absorbents looked very attractive. The absorptive capacity being so much greater than water offered possibilities of great savings in heat required to expel the SO_2 from the solvent. However, we were not able to efficiently supply external or indirect heat to liberate the adsorbed SO_2. The inability to accomplish this was due to the poor heat transfer obtainable through the adsorbent beds. We therefore concluded that a solid adsorbent of this type was not suited to our purpose of concentrating a gas. Another objectionable feature possessed by activated charcoal was its catalytic activity in oxidizing SO_2 to SO_3.

It seemed very evident that a radically different principle would have to be followed before a successful low cost process could be developed. The idea of separating sulphur dioxide from its gaseous mixture by the use of a solvent was abandoned and instead a method sought for its separation by selective liquefaction at low temperature. A very efficient pressure refrigeration process was the result of our efforts. The fundamental principles underlying the new process were worked out in the laboratory and the heat balances and pressure-temperature relationships were calculated by the writer. Estimated operation costs looked promising for a large plant. The next step was to put the process to test on a pilot plant scale. The plant has now been in operation a sufficient time to demonstrate its success; about 80 tons of high grade product has been produced. I shall briefly explain some of the salient features of the process as worked out from our experimental operation.

Liquefaction Process

As a necessary adjunct to our new process we required an efficient gas purification system. The gases from copper converters contain much metallic dust as well as arsenic trioxide and sulphur trioxide fume in a fine state of subdivision. The greater part of this suspended material is not subject to separation in dust settlers or by centrifugal means. The ordinary smelter practice of electrical precipitation followed by special filters cleaned the gas very satisfactorily. The gas after being cleaned passes to a gas storage of suitable capacity to iron out fluctuations in gas strength as well as to bridge over any short periods when no gas is obtainable from the converters.

From the storage the gas, which may vary in strength from 5 to 14 per cent, passes to the liquefaction system. It is compressed to a pressure of approximately 20 atmospheres, the heat of compression removed, and given a special drying treatment which involves neither the use of a chemical drier or removal of water by refrigeration. The compressed gas is then cooled to a temperature of approximately minus 100 deg. F. which causes condensation of substantially all of the SO_2 to the liquid condition. The refrigeration is produced by expansion of compressed gas with the production of external work. The power recoverable from the expansion is of a considerable quantity; it is converted into electric power by a generator of variable capacity.

The process has numerous advantages over the water absorption process. Corrosion troubles are practically eliminated. Where it might occur is limited to traps and separators which are made of corrosion resistant materials. Special precautions are taken to prevent condensation of water in the compressor and pipe lines. As you know from experience in pulp mills, SO_2 is not corrosive as long as water is kept in the vapor phase.

The product obtained is of very high grade; it is very low in moisture and remarkably free from oil. The process is flexible, well adapted to a gas of varying strength. An additional advantage is that the liquefaction system may be closed down and started up again with no appreciable lag. Considerably lower production costs than with the water absorption process are possible.

Power is one of the important items of cost, which makes Tacoma a logical place for a large plant because of its cheap electrical power.

The use of large quantities of liquid sulphur dioxide by the bisulphite mills must naturally be predicated upon a price in line with its value as a substitute for the product from the existing sulphur burners.

Advantages of Liquid SO_2

There are many obvious advantages of introducing SO_2 in pure form, undiluted with air, into the acid and recovery systems. A stronger acid may be made and almost unlimited flexibility is possible in regulation of free acid combined in the cooking acid.

The following table shows the free acid to be expected with a

17 and a 34 per cent gas for various temperatures of acid at the bottom of the tower:

Temperature		Free acid in percentage		Per cent increase with
Deg. C.	Deg. F.	17 per cent gas	34 per cent gas	34 per cent gas
15	59	2.75	4.75	73
20	68	2.25	3.50	56
25	77	1.75	3.00	41.5

This increase in free acid by fortifying the gas in sulphur dioxide can be accomplished without raising the combined appreciably. This factor has an advantage during summer operation when high water temperature causes considerable difficulty due to greater solubility of the lime rock and hence high combined. There is no doubt but what the trouble can be entirely eliminated by the use of liquid sulphur dioxide.

A higher free SO_2 in the raw acid has possible advantages in subsequent parts of the system. More relief liquor from the digester is returnable to the recovery since greater dilution can be provided for with a corresponding reduction in sulphur consumption per ton of pulp.

We have considered above some of the more obvious advantages to be expected by introducing liquid sulphur dioxide into the acid towers. However, upon analyzing the situation more carefully it would appear that we would be degrading the product somewhat to dilute it with air in that manner. The maximum effect of the 100 per cent. SO_2 would be obtainable in the recovery system when the strength of the raw acid could be boosted in free SO_2 to any desired extent and allow greater return of relief digester liquor. We have the following values for free acid obtainable from a 100 per cent gas at various acid temperatures:

Temp. deg. C.	Temp. deg. F.	Free acid in percentage from a 100 per cent gas
15	59	12.5
20	68	10.3
25	77	8.9

We do not mean to stress the advantage of a high free acid in the cooking acid, because authorities are not agreed as to its beneficial effect in sulphite digesters. The experimental data on the influence of higher acid are very meager. This is doubtless due to the fact that an appreciably higher free acid is not obtainable when burning sulphur as the source of SO_2, and experiments in that direction would have little practical value. However, the majority of writers seem to be of the opinion that there are advantages to be expected in that direction. Edwards[2] states that experiments relative to the advantage of using a stronger acid indicate that an acid containing double the SO_2 concentration usually employed decreases the time by 25 per cent and increases the normal yield 10 per cent. Indications point to greater penetration, shorter time of cook and reduction in cost of bleach.

Sutermeister[3] states that the "present tendency is toward the use of acid of high strength, particularly in free SO_2." It has also been said that pulp made with stronger liquor has a greater bleachability.

Another advantage to accrue from introduction of liquid SO_2 into the acid plant is the increased capacity of the latter without capital outlay.

Thus far we have said nothing about the purity of gas from liquid SO_2 as compared with that from sulphur burners. The deleterious effects of free sulphur, SO_2 and selenium are well known; these impurities are absent in liquid sulphur dioxide. Edwards "considered these and other advantages to be great enough so that it would pay to purchase it at $15 per ton as against $24 per ton for sulphur, both F.O.B. mill."

It has been suggested from time to time that the refrigeration obtainable from the vaporization of the liquid SO_2 to the gas might be put to good use—this from the fact that some mills are employing ammonia refrigeration for cooling the water to the acid tower. However, the evaporation of one ton of liquid SO_2 at ordinary temperatures absorbs heat equivalent to the melting of 0.81 ton of water ice. This quantity of refrigeration, while it at first appears not inconsiderable, yet when we calculate the heat capacity of the water to the acid tower, is relatively not large. I have calculated that for a 150 ton pulp mill it would require the vaporization of 14 tons per day of liquid SO_2 to lower the temperature of the water one degree Fahrenheit. The recovery of this refrigeration by cooling the water is therefore not to be thought of. On the other hand, some slight advantage may be obtained from cooling the gas at the point of introduction and improve the absorption somewhat.

If it is not economical to vaporize the liquid by heat exchange with the tower water the question arises: How is it to be introduced into the system in gaseous form? When used to only partially replace sulphur dioxide from the burners, it can be introduced by a suitable arrangement into the cooler header following the combustion chamber. The burner gases would then supply the necessary heat for vaporization. On the other hand, if it were desired to eliminate the sulphur burners and to use liquid SO_2 exclusively or to introduce the latter into the recovery system, steam-jacketed vaporizers would be satisfactory, entailing a steam cost of not more than 15 cents per ton of liquid SO_2 vaporized.

It is the history of scientific development that when a commodity becomes available at a reasonable price new fields are opened up for its utilization in industries, previously closed to it. Pure liquid sulphur dioxide is a wonderful solvent for certain types of organic compounds. This is the secret of its replacement of sulphuric acid in the refining of oils of asphaltic base. Very interesting experiments of McKee, Cable and others show that pure liquid SO_2 is superior to benzene in the extraction of resins from certain woods. It is quite possible that this commodity in liquid form will lend itself to the treatment of highly resinous woods, for special purposes, where several cooks with ordinary bisulphite liquor would be required for complete digestion.

[2] Edwards, Paper 26, 350-4 (1920).
[3] Sutermeister, Chemistry of Pulp & Paper Making, p. 220. John Wiley & Sons, 1929.

New TAPPI Members

D. P. Bailey, paper development, Flintkote Company, Rutherford, N. J.

C. E. Braun, general superintendent, Puget Sound Pulp and Timber Company, Everett, Wash.

F. C. Broeman, analytical and consulting chemist, Broeman Building, Cincinnati, Ohio.

H. G. Burrill, chief engineer, John D. Hamilton, Baltimore, Md.

F. J. Cirves, research and development, Mosinee Paper Mills, Mosinee, Wis.

G. A. Dennis, vocational director, Oxford Paper Company, Rumford, Me.

W. M. Hayes, laboratory foreman, Interlake Pulp and Paper Company, Appleton, Wis.

W. H. Monsson, Munising Paper Company, Munising, Mich.

H. I. Morton, control chemist, Oxford Paper Company, Rumford, Me.

C. M. Myers, chemist, Hollingsworth & Whitney Company, Waterville, Me.

A. G. Norris, district manager, industrial division, Timken Roller Bearing Company, Boston, Mass.

O. R. Shuey, soda mill superintendent, 682 Fayette street, Cumberland, Md.

F. A. Simmonds, assistant chemist, Forest Products Laboratory, Madison, Wis.

Andrew Muirhead Dead

BOSTON, Mass., June 23, 1930.—Andrew Muirhead, 50, superintendent of the Robert Gair Company, died at the Benson Hospital, Haverhill, Mass., June 20. Mr. Muirhead was taken suddenly ill at his residence in Bradford, Mass., June 8, and went to the hospital for an operation. He was born in Glasgow, Scotland, and went to Haverhill 22 years ago as superintendent of the Haverhill Boxboard Company, now a unit of the Robert Gair Company.

Determining pH Values and Total Acidity *

By B. L. Wehmhoff[1]

The Government was the pioneer in placing definite acidity requirements in specifications for paper intended for permanent record use. The Government specifications for paper for the year beginning March 1, 1929, carried acidity requirements for two grades of paper, 100 per cent rag book and 100 per cent rag ledger, with a total estimated purchase of 240,000 pounds. In the specifications for the year beginning March 1, 1930, these requirements have been extended to cover 11 grades of paper, including practically all the 100 per cent and some of the 50 per cent rag paper, and 1 chemical wood paper. The estimated purchase of these papers for the year is 2,500,000 pounds, having a value of approximately one-half million dollars. The acidity requirements as now carried in Government specifications are expressed as pH values. Whether or not total acidity might better express the desired characteristics of paper will not be discussed at this time. There is a multiplicity of methods for determining acidity, both as pH values and total acidity, with a corresponding multiplicity of results.

It has been noted in many articles where pH values of paper are mentioned that no statement has been made as to the method by which the data were obained. Some laboratories use the electrometric method, which is the more accurate but for which there are several modifications. Others use the colorimetric method, the procedure varying somewhat, one using liquid standards[2], another glass, and a third using the isohydric indicator standards as described by Fawcett and Acree[3]. Still others recommend indicator foil[4].

There are three methods commonly used to determine the total acidity of paper—the American Society for Testing Materials (tentative)[5], the Kohler-Hall[6], and that of the Rag Content Paper Manufacturers Association laboratory[7]. A variation of the latter is used at the Bureau of Standards.

Various investigators have noted from time to time that the method used in determining pH values of certain solutions affects the results to a considerable extent. Blum and Bekkedahl[8] have made a thorough study of the variations in results obtained by different methods on nickel-plated baths. Fawcett and Acree[10] state that 0.2 to 0.25 must be added to the pH readings with M/20 buffer color standards to correct for salt errors. These results show that corrections as high as 0.5 pH are sometimes necessary when using colorimetric methods, especially with fairly concentrated salt solutions.

The experience of the Government Printing Office in the purchase of paper, the specifications for which include acidity requirements, indicated that similar corrections might also be necessary in the determination of pH values of paper.

That this subject is of interest to the paper industry is evidenced by the numerous articles which have appeared from time to time in the Paper Trade Journal and Technical Association Papers, and also in foreign technical journals. Since this work was started, Doctor Minor, of the Rag Content Paper Manufacturers Association laboratory, requested the Government Printing Office to furnish a series of rag content paper samples for use in cooperative tests on pH determinations by the laboratories of that association.

It was apparent that further research, covering methods for the determination of pH values and total acidity on paper, was desirable, and in fact essential, to the application of acidity requirements to paper specifications. A research program has therefore been instituted in which the Bureau of Standards, the Bureau of Chemistry and Soils, and the Government Printing Office are cooperating. This program is divided into three phases.

First, a study of the different methods for the determination of pH values and total acidity of paper in order to determine the most accurate method for each and to ascertain the corrections that should be applied to the results obtained by the other methods in order to make them approximate those obtained by the method found most accurate. Also a study of the relationship between pH values and total acidity.

Second, a study of acidity in paper in order to ascertain the extent to which it is possible to eliminate acidity during the process of manufacture. This portion of the program will probably be conducted in cooperation with the research department of one or two paper manufacturers. Separate research is under way at the Bureau of Standards, the Bureau of Chemistry and Soils, and other laboratories to determine the effect of acidity on the permanence of paper.

Third, the application of the results of the two preceding phases to the Government specifications for paper, and methods of paper testing in the Government laboratories.

This report is merely a preliminary report on the first phase of the above program given at the request of the chairman of the Fine and Special Papers Committee of TAPPI.

Two samples each of six kinds of paper, ranging in quality from news print to permanent-record bond and ledger papers, were selected. All samples were taken from deliveries of paper to the Government Printing Office. Wherever possible the samples of the same quality paper were taken from deliveries manufactured by different mills. All samples tested at the Bureau of Standards and the Government Printing Office were prepared for testing by being ground in a paper grinder as designed and used in the Government Testing Institute in Stockholm. The Bureau of Chemistry and Soils used a Wiley mill.

pH Determinations

Several series of pH determinations will be made on all samples, using different methods. Some have been completed and are given in this report. Those made by the electrometric method using the quinhydrone electrode[9] were made at the Government Printing Office, the others having been made at the Bureau of Standards. The isohydric indicator method involves the adjustment of the pH of a series of solutions of the same indicator at two-tenths pH intervals. The pH value of an unknown solution is the same as that of the one of the series of adjusted indicators whose color remains unchanged when mixed with the unknown solution. The nonisohydric indicators are commercial colorimetric pH sets. The results of the Bureau of Chemistry and Soils on these samples are not as yet available.

One of the variables in the determination of pH values is in the methods of extraction of the sample. Hoffman[11] uses 5 grams of shredded paper with 250 cubic centimeters of water. He states that this proportion is arbitrary and was chosen since it approaches the concentration of the stock as it goes on the paper machine. This seems to be a logical concentration and, since some definite ratio of paper to water was necessary, we have used the same proportions as Mr. Hoffman.

Another variable is the length of time for extraction of the sample with boiling water. Hoffman[11] extracts one hour, the Rag Content Paper Manufacturers laboratory[10] five minutes, and Schulz[4] one hour at 90 deg. C. Research at the Government Printing Office laboratory on different qualities of paper extracted for periods of time, varying from two minutes to one and one-half hours, indicated that with some papers complete extraction —that is, minimum pH values—may be obtained with 15 or 30

* Presented at the annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Member TAPPI, Technical director, Government Printing Office, Washington, D. C.

minutes' extraction, while with others one hour is necessary. More than one hour appeared to have practically no effect on the results. An extraction period of one hour was therefore chosen as giving complete extraction of the available acidity. This conclusion is verified by a study of the results obtained by Schulz[4].

The distilled water used was of two kinds—ordinary distilled and superpure. The latter was made in a special commercial still so designed that the water is subject to a double distillation and aerated with CO_2 free air, as described by Fawcett and Acree[5]. This water had a pH of 6.9 to 7.1, measured by both conductivity methods and isohydric indicators.

Those determinations in which superpure water was used were made in Co_2 free atmosphere in order to eliminate in so far as possible the effect of CO_2 on the determinations.

All glassware used was Pyrex, since it has long been known that ordinary soft glassware affects the pH value of unbuffered or sightly buffered solutions to a marked degree.

The pH values so far obtained on the samples will be found in the following tabulation:

Although it is not possible to draw definite conclusions at this time, the following indications are noticed:

1. The presence of CO_2 has a noticeable effect on determinations made with the quinhydrone electrode, the decrease due to the CO_2 varying from 0.02 to 0.41 pH. The results on one sample were contradictory.

2. The presence of CO_2 has no effect on colorimetric determinations.

3. In general, results obtained with isohydric indicators check those obtained with the quinhydrone electrode more closely than do those obtained with the nonisohydric indicators. Particular attention is directed to the results shown for sample No. 49895, news print, the extract from which is probably only slightly buffered. As a result the nonisohydric indicators, which are adjusted to the upper point of their range, give a considerably higher pH than either the isohydric indicator or the quinhydrone electrode.

The work now under way includes the completion of the series given in the above table, also electrometric determinations with the hydrogen electrode, and colorimetric determinations by other methods such as the Stirlen wedge, Hellige glass comparator, and Wulff foil indicators.

Total Acidity

There is considerable variation in the different methods for the determination of total acidity, both as to the procedure employed and in the expression of results. The American Society for Testing Materials method requires 1 extraction for 5 minutes, the Kohler-Hall 3 successive extractions for 1 hour each, and the Rag Content Paper Manufacturers laboratory 1 extraction for 2 minutes. The Bureau of Standards makes 1 extraction for 1 minute. In some cases the fibers are removed from the extract by filtration before the titration is made; in others the titration is made in the presence of the fibers. Some express results in per cent SO_3, others as per cent H_2SO_4, and still other use acid numbers. Each method has its points of value and each has also some disadvantages. It is hoped that this study will produce a method having a minimum of disadvantages with a maximum of advantages.

TABLE II
TOTAL ACIDITY DETERMINATIONS

Kind of paper	Test No.	Total acidity determinations (ordinary distilled water used): Kohler-Hall method: Bureau of Standards: Per cent SO_3	Bureau of Standards: Acid No.	Government Printing Office: Per cent SO_3	Government Printing Office: Acid No.	A. S. T. M. method (Government Printing Office), per cent SO_3	Rag content paper laboratory method (Government Printing Office), per cent SO_3
100 per cent rag bond...	48871	0.165	41.25	0.190	47.42	0.087	0.247
Do	49530	....	....	.198	49.39	.104	.270
100 per cent rag ledger..	48464	.091	22.75	.105	26.34	.049	.114
Do	47560	.146	36.50	.134	33.60	.131	.141
100 per cent rag book...	42411	....	....	.094	23.45	.047	.128
Do	45028	.095	23.75	.096	23.99	.037	.124
50 per cent rag book....	49803	....	....	.177	44.30	.065	.253
Do	47704	....	....	.082	20.60	.041	.106
Sulphite writing	49899	.152	38.00	.165	41.36	.056	.191
Do	49818	....	....	.078	19.58	.032	.097
News print	49861	....	....	.052	13.00	.027	.093
Do	49895	.050	12.50	.070	17.62	.028	.110

The 12 samples are being analyzed for total acidity by each of the different methods in order to determine the reproducibility of results in each of the cooperating laboratories and to obtain data as to the comparative results obtained by each of the methods.

The following tabulation gives the results so far obtained, but, as in the case of the pH determinations, the work has not progressed to the stage where any conclusions or recommendations are possible.

In order to ascertain the effect of CO_2 on the Kohler-Hall method, additional analyses were made of several samples. In some, superpure water was used and the flasks were swept with CO_2 free air during the titration In others ordinary distilled water was used, the flasks being swept with CO_2 free air. A comparison of the results with those obtained by the usual pro-

TABLE III
EFFECT OF CO_2 ON DETERMINATION OF TOTAL ACIDITY BY THE KOHLER-HALL METHOD

Kind of paper	Test No.	Usual procedure: Bureau of Standards, per cent SO_3	Usual procedure: Government Printing Office, per cent SO_3	Gov. Prg. Off., ordinary distilled water, flask swept with CO_2 free air, per cent SO_3	Bureau of Standards, superpure water, flasks swept with CO_2 free air, per cent SO_3
100 per cent rag bond....	48871	0.165	0.190	0.189	0.168
100 per cent rag ledger..	48464	.091	.105	.107	.091
100 per cent rag book....	45028	.095	.096	.094	.091
50 per cent rag book.....	49803	....	.177	.175	....
Sulphite writing	49818	....	.078	.078	....
News print	49861	....	.052	.054	....

TABLE I.—pH VALUES

Kind of paper	Government Printing Office test No.	Electrometric (quinhydrone electrode): Ordinary distilled water	Electrometric (quinhydrone electrode): Superpure water	Colorimetric: Ordinary distilled water: Non-isohydric indicators	Colorimetric: Ordinary distilled water: Isohydric indicators	Colorimetric: Superpure water: Non-isohydric indicators	Colorimetric: Superpure water: Isohydric indicators
100 per cent rag bond.....	49530	4.66	.....	.....	.....	.....	.....
Do	48871	4.46	4.41	(a)4.6	(a)4.25	(a)4.6	(a)4.2
100 per cent rag ledger....	47560	4.84	4.72	(a)4.8	(a)4.5	(a)4.8	(a)4.5
Do	48464	5.00	5.41	(a)5.64 (b)5.1	(a)4.75	(a)5.6 (b)5.1	(a)4.7
100 per cent rag book.....	42411	4.32	4.49	.....	.....	.....	.....
Do	45028	4.18	4.3	(a)5.0	(a)(c)4.00	(a)5.0	(c)3.93 (a)4.00
50 per cent rag book.....	49803	4.22	.....	.....	.....	.....	.....
Do	47704	4.95	4.99	.....	.....	.....	.....
Sulphite writing	49844	4.07	4.18	(a)4.6	(a)(c)3.9	(a)4.65	(a)(c)4.1
Do	49818	5.05	5.24	.....	.....	.....	.....
News print	49895	4.86	4.88	(d)6.6	(b)5.1	(d)6.6	(b)5.1
Do	49861	4.87	5.18	.....	.....	.....	.....

(a) Brom cresol green. (b) Chlorphenol red. (c) Brom chlorphenol blue. (d) Bromthymol blue.

TABLE IV

EFFECT OF DIFFERENT INDICATORS ON TOTAL ACIDITY BY KOHLER-HALL METHOD

Kind of paper	Test No.	Ordinary distilled water		Superpure water	
		Phenolphthalein	Bromthymol blue	Phenolphthalein	Bromthymol blue
100 per cent rag ledger..	48464	0.091	0.078	0.091	0.070
100 per cent rag bond....	48871	.165	.144	.168	.145
100 per cent rag book....	45028	.095	.083	.092	.077
Sulphite writing	49899	.152	.130	.153	.129

cedure, given in Table III, indicates that CO_2 has little if any effect.

Four samples were analyzed at the Bureau of Standards by the Kohler-Hall method, using different indicators in order to ascertain their effect on the results. The indicators used were phenolphthalein, which has a pH range of 8.4 to 10.0, and bromthymol blue, which has a pH range of 6.0 to 7.6. The former is specified in the Kohler-Hall method. The following table shows that consistently lower results were obtained with bromthymol blue, as would be expected from the pH ranges of the two indicators. It seems probable that bromthymol blue gives the more correct results. The difference between phenolphthalein and bromthymol blue may be partly due to a difference in the blank titration necessary to produce a color change. Bromthymol blue can not be used if the extraction is even slightly yellow.

References

[2] Taylor, W. A., Technical Association Papers, Series IX, No. 1, 38-43, 1926.

[3] The problem of dilution in colorimetric H-ion measurements. Fawcett, E., and Acree, S. F., Journal of Bacteriology, Vol. XVII, No. 3, March, 1929.

[4] Schulz, Dr. Bruno. Wochenblatt fur Papier Fabrikation, Vol. 59, No. 39, September, 1928.

[5] American Society for Testing Materials, Tentative Standards, 1926.

[6] Hall, Gosta. Permanence of Paper, Paper Trade Journal, Vol. 82, No. 14, 52-58, April 8, 1926.

[7] Laboratory report, Rag Content Paper Manufacturers Association, December, 1929.

[8] The measurement of pH in Nickel Plating Solutions. Blum, Dr. W., and Bekkedahl, N., Trans. Am. Electrochem. Soc., 56 (1929) preprint.

[9] Parker, H. C., J. Ind. and Eng. Chem., Vol. 20, 676-680, July, 1928.

[10] Letter from J. H. Burgen, dated October 29, 1929.

[11] Hoffman, W. F., Tech. Assoc. Papers, Series XI, No. 1, 62-64, 1928.

[12] Fawcett, E., and Acree, S. F., J. Ind. and Eng. Chem., Vol. II, No. 1, 78, Analytical edition, January 15, 1930.

Rosin Sizing Literature Review *

By Marion B. Swift[1]

Most of the studies recorded in the literature have had either the free rosin theory or the aluminum resinate theory as their basis. As you know, rosin sizing was first discussed by Illig in 1807 and was put into use about 1820[2]. Since size was applied to the fibers in the form of a soap and a chemical reaction with the alum seemed needed to fix the rosin on the fibers, the earlier studies centered about that reaction. Illig believed that free rosin was deposited in the fibers by the action of the alum which neutralized the alkali of the size then hydrolyzed into alumina and rosin. But, apparently his theories were overlooked as, for a long time after rosin sizing came into use, the accepted theory was that the sodium resinate of size reacted with the added alum to form aluminum resinate and this aluminum resinate was the active sizing agent.

In 1878 Würster published articles supporting the free rosin theory and referred to the earlier work of Illig. This work received so much attention that ever since that time there have been a number of supporters for both theories.

Sieber's Work

In 1922 and 1923 several prominent workers published discussions of the theory of rosin sizing as a result of their experimental work. Among those was Sieber[3] who introduced a third theory of the mechanism of this reaction. He considered sizing a colloidal reaction. He first studied the effects of electrolytes, particularly alum, on suspensions of free rosin. His experiments showed that the nature of the rosin did not effect the results but that in using free rosin larger quantities of the precipitating agent were required than with the soap. His explanation of the precipitation of the rosin by alum solution was, that while free rosin in solution carried a negative charge, a colloidal aluminum hydroxide formed by the hydrolysis of the alum carried a positive charge and that this aluminum hydroxide discharged the negatively charged free rosin particles causing them to settle out.

Next he considered the sizing properties of such a suspension of free rosin and the experiments showed that although free from rosin thus treated a small amount of rosin was absorbed by the fibers the resulting paper was not sized to ink.

His next group of experiments dealt with the reactions between alum and sodium resinate. If equivalent amounts of alum and sodium resinate are mixed aluminum resinate is formed which is only slightly ionized in solution giving only a small amount of free rosin. With an excess of alum, more free rosin and aluminum hydroxide are formed and since both free rosin and aluminum resinate are very slightly soluble and form colloidal solutions, they will be precipitated out together in a colloidal form. Therefore, all the results seemed to indicate that colloidal reactions as well as chemical ones were concerned in the complete precipitation of the resinate.

The next point that he considered was the behavior of the mixture of sodium resinate and free rosin, as they exist in size, toward alum. To his surprise experiments showed that alum in a less quantity than was calculated from the known requirements of free rosin and of sodium resinate would completely and quickly precipitate the size. When the free rosin was in excess of 50 per cent, in which case it was not all covered by the emulsoid resinate, an excess of alum was required.

He also showed that calcium and magnesium resinates have practically no sizing value and this explains why it is necessary to use larger quantities of size if hard water is being used.

From microscopical studies, he observed that pure cellulose fibers act as a semi-permeable membrane and when in contact with aluminum resinate the inorganic ions pass through the walls of the fibers leaving the rosin as a precipitate in the water. As to the action between the alum and the fibers, he could not decide as to whether aluminum hydroxide is formed hydrolytically or whether the action of the fibers is necessary to decompose the alum allowing the formation of aluminum hydroxide which is then fixed on the fibers. He was satisfied that the aluminum hydroxide being colloidal and having a positive charge precipitated the free rosin from a suspension and absorbed it. All experiments led to the belief that free rosin alone would not serve as a sizing agent, for papers so sized were soft and non-resistant to ink. He declared that although alum is by far the most satisfactory precipitant the best sizing results are obtained if both free rosin and sodium resinate are present for if only one or the other is present the resulting paper is penetrable to ink.

Zhereboff's Theories

Zhereboff was another to make a large contribution to the theory of rosin sizing. He admits that size solution is a colloid but does not use colloidal chemistry in explaining the reactions occurring in the sizing of paper or in the later deterioration of paper. He mentions[4] the findings of several other workers which substantiate a chemical combination of the fibers and the size. Burkhardt believed that the small particles of rosin were held to the fibers by some physical attachment which could be destroyed

---

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., February 19, 1930.

[1] Chemist, Paper Makers Chemical Corporation, Holyoke, Mass.

[2] S. R. Olsen, PAPER TRADE JOURNAL, Vol. 87, No. 15, 59-63 (1928).

[3] Dr. Rudolf Sieber, PAPER TRADE JOUR., Vol. 75, No. 15, 49-53; No. 16, 43-46; No. 17, 59-61; No. 18, 50-53, 1922.

[4] L. B. Zhereboff, PAPER TRADE JOUR., Vol. 76, No. 11, 50 (1920).

by the action of sunlight and thus causing the paper to lose its sizing. Wolesky and Haase on the other hand, believed that sizing was a chemical combination between the fibers and the size and that sunlight altered this chemical combination.

Zhereboff, himself, contended that the sodium resinate of size formed a thin molecular layer of free rosin on the fibers. His experiments showed that sunlight would destroy the sizing of papers, regardless of their composition, in a relatively short time. Those rays which were most destructive were found to be violet, blue and yellow.

Ivanov and Lorenz

Ivanov[5] studied the action of light on paper and looked upon the fixation of size on fibers as an electrical phenomena. He used, for his tests, well sized writing paper made before the war and for his source of light the voltaic arc. The light from the arc destroyed the sizing but it could be restored with a hot iron and the paper then carried an electric charge. He destroyed sizing by placing the paper in a drying oven at 100 deg. C. and in this case also, sizing was restored by a hot iron.

His conclusions were that a high voltage discharge or cathode rays destroyed sizing but that red light rays or a hot iron would restore it. These results indicate that the sizing quality of paper is dependent on the electrical condition of the paper, of the sizing materials and of the ink. His explanation was that the cellulose was a negatively charged absorbent and the rosin size a negatively charged colloid phase. The alum was a disperse phase of a colloidal aluminum hydroxide in an acid medium and neutralized the negative charges on rosin emulsion and cellulose causing precipitation and allowing adsorption of aluminum hydroxide and rosin to the paper.

Lorenz[6] next made an extensive study of sizing from the colloidal viewpoint and as Olsen has stated very clearly the theory advanced by Lorenz I will quote him[7]. Lorenz maintains that all sizes are colloidal and that due to the large dilution in the beater, complete hydrolysis takes place, setting rosin acid free, which condenses to form colloidal particles. He believes that chemical reaction such as the formation of aluminum resinate cannot occur under these conditions since rosin acids and resinate ions are only present in small amounts. He suggests that alum acts as a coagulating medium and not as a chemical agent. Accordingly with negative charged cellulose and negatively charged rosin and intimate contact such as is obtained in the beater the paper can be sized, but the film cracks and breaks down on aging permitting ink to penetrate the fibers, but with aluminum hydroxide the cellulose and rosin would be bonded together resulting in a permanently sized paper.

Oman, Herzberg and Hall

Oman[8] later worked with the aluminum resinate theory but does not support it. He believes that the rosin forms a layer enclosing the fibers due to the fact that the fibers absorb alum and become positively charged and thus attract the negatively charged rosin. Other salts can be used in place of alum but will not give as large a positive charge to the fibers. The quantity of negative charge on the rosin is dependent on the degree of dispersion of the rosin.

As to whether it is the rosin or the fibers which are responsible for paper deterioration is an open question. Herzberg[9] claims that sunlight destroys sizing due to the light rays causing a chemical change in the rosin. Hall[10] states that Swedish investigations on Government paper revealed no decided difference in permanency between commercial rag paper and bleached sulphite paper, but his later study attributed the deterioration of rag paper to glue sizing. One set of papers which showed poor resistance to sunlight was hard sized and therefore of higher acidity which seemed to partl yaccount for lack of permanency. His investigations indicated that rosin and fillers were a protection against sunlight. The following portion of Hall's summary gives a clear statement of his observations.

"1. Rosin sizing causes an increase in the degree of acidity of the paper, so that both upon exposure to heat and light the rapidity in the conversion of the cellulose in the fibrous material is increased, for which reason it is probable that rosin sizing of paper causes a reduction of its permanence as compared with unsized paper.

2. The deterioration in the permanence of the paper through rosin sizing, however, is probably not so great that rosin sizing may for that reason be considered unsuitable for papers which require high permanence provided that sizing be carried out without the use of an excess of alum.

3. Rosin sizing causes an immediate diminution of the folding strength as compared with the same paper in an unsized condition.

4. The substitution of aluminum acetate for aluminum sulphate in rosin sizing does not appear to possess any advantage in so far as the permanence of the paper is concerned."

During the last year there has been evidence of increased interest in the theory of rosin sizing and the permanence of paper. A number of interesting articles have been published in indication of this.

Hoffman[11] discussed the effect of acidity on paper. His interest centered chiefly in the acidity caused by alum, and his belief is that too high acidity should be avoided if a paper which will not deteriorate on aging is desired.

The Bureau of Standards[12] is vitally interested in the question of paper permanence, and has already made some studies of the question. They were uncertain as to whether the high rosin content of the paper caused it to deteriorate or if there was a change which occurred in the beaters and that did not show up until the paper was heated.

Edge[13] in a report before the London Division of the British Technical Section tells of some interesting experimental work on rosin sizing which he has done. The interesting point which he brings out is that 0.7 per cent rosin gave the best sized paper using pulp beaten to 40 wetness on Schopper Reigler Scale. When he kept the quantity of rosin constant at 0.7 per cent and added sufficient alum to bring the pH to 5.0 but the degree of wetness was varied, it was found the best comparative sizing was obtained at 35 degrees wetness. Alum was found essential to satisfactory sizing under ordinary mill conditions. In order to size without alum a wetter pulp and a larger quantity of rosin must be used. Experiments showed that paper could be hard sized with a dry precipitation of acid aluminum resinate and slightly sized with calcium resinate. Edge feels that the results of his work refute the idea that the melted rosin forms a film over the fibers and the idea of electrical attraction of positively charged cellulose for negatively charged rosin. He believes that a study should be made of the effects of such factors as acidity, temperature and moisture on sizing or more specifically on the fine precipitates of the resinates on the fibers.

Dr. Harrison[14] in commenting on the report of Edge felt that it would be necessary to combine the electrical, the chemical and the mechanical theories before sizing could be satisfactorily explained.

---

[5] N. D. Ivanov, Paper Trade Jour., Vol. 79, No. 2, 41 (1924).
[6] Rudolph Lorenz, Verein Der Zellstoff Und Papier Chemiker U Ingenieure, May, 1923.
[7] S. R. Olsen, Paper Trade Jour., Vol. 87, No. 15, 59-63 (1928).
[8] E. Oman, Paper Trade Journal, Vol. 86, No. 14 (1928).
[9] E. Oman, Paper Trade Journal, Vol. 86, No. 14 (1928).
[10] Gosta Hall, Paper Trade Journal, Vol. 82, No. 14, 52 (1926).
[11] W. F. Hoffman, Paper Trade Journal, Vol. 88, No. 12, 59-60 (1929).
[12] Bureau of Standards, Paper Trade Jour., Vol. 88, No. 16, 56 (1929).
[13] S. R. Edge, World's Paper Trade Review, 1929, 1974-1976, 2102-2104, 2142-2146, 2180-2184.
[14] Dr. Harrison, World's Paper Trade Review, 1929, 1974-1976, 2102-2104. 2142-2146, 2180-2184.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is 25 cents per page. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency not stamps.

Pulp Production—Misc.

Process for the Production of Pulp of a High Degree of Purity. H. Heimann, I. Petersen, A. Bayerl and H. Seefreid assignors to I. G. Farbenindustrie A.-G. Can. pat. 284,973, Nov. 20, 1928.—Material containing cellulose is opened up by impregnating with dilute nitric acid at ordinary, raised or reduced pressure. The materal is then boiled in the known manner with an alkaline agent to obtain a cellulose of high degree of purity; e.g., small pieces of wood are digested with 20 per cent nitric acid at 50 deg. C., until they are impregnated completely. The wood is then freed from excess of acid by decantation and allowed to stand until a sample is completely disintegrated, when it is boiled with dilute sodium carbonate. The opened up material is worked up in known manner by boiling it with an alkaline agent. —A. P.-C.

Treatment of Pulp. Sociétę Barrou et. Cie. Fr. pat. 639,426, Jan. 21, 1927.—The quantity of water used in cellulose manufacture is reduced by diluting the pulp before it enters the presses, using the water pressed out for adding to the pulp coming from the bleachers and using the water from the thickening cylinders for washing the cellulose after defibering. *Fr. pat. 639,427* describes a process for bleaching cellulose with sulphite liquor in which calcium carbonate is added to the liquor to transform the sodium sulphate formed into sodium carbonate.—A. P.-C.

Hydrated Cellulose. I. G. Farbenindustrie A. G. Fr. pat. 636,803, June 29, 1927.—The tendency of hydrated cellulose to expand is reduced by impregnating it, as freshly precipitated or dried, with resins soluble in water or alkalies and then treating with a substance to render the resin insoluble. Phenol-sulphur or phenol-formaldehydesulphur resins are suitable with an after-treatment with formaldehyde to render them insoluble. Condensation products of urea and formaldehyde may also be used.—A. P.-C.

Process of Treating Pulp. Wollf and Co. and R. Weingand. Eng. pat. 288,997, April 19, 1927; Fr. pat 642,176, Oct. 11, 1927.—Cellulose which has been freed from hemi-cellulose, wholly or in part, by treatment with alkali, is treated with a salt solution or other suitable liquid prior to washing with water, in order to avoid further formation of hemicellulose. Sodium chloride, potassium sulphate or alcohols may be used.—A. P.-C.

Pulp-Treating Process. George A. Richter assignor to The Brown Co. Can. pats. 286,460, 286,461 and 286,461, Jan. 15, 1929. —No. 286,460—Sulphite fiber of non-coniferous origin is digested in a solution of caustic soda at a temperature below 70 deg. C., and then washed free of alkaline solution. The treated fiber is softer and has a higher tear resistance and is better suited for the preparation of cellulose derivatives than the untreated fiber. No. 286,461—Groundwood is digested in a 4 to 10 per cent solution of caustic soda at a temperature below 70 deg. C. and the digested pulp is then washed free of alkaline solution. The pulp has an original pentosan content of 10 to 14 per cent and is treated until such content is reduced to 5 to 7 per cent. No. 286,462—Previously liberated fiber of the character of hemp and jute is digested in a 4 to 10 per cent caustic soda solution at a temperature below 70 deg. C., and the digested fiber is then washed free of alkaline solution. The original fiber has a pentosan content as high as 12 per cent and the fiber is treated until such content is reduced to about 4 to 6 per cent.—A. P.-C.

Process for the Production of Cellulose. Gesellschaft für Mechanische Zellulose m.b.H. Fr. pat. 33,145, March 14, 1927; addition to Fr. pat. 579,237.—Freshly cut grasses, reeds, bamboo or waste from banana plants are cut into small pieces, ground dry in mill, washed with water and beaten in a hollander. The product is used for the manufacture of cellulose.—A. P.-C.

Means for Preparing Paper Pulp. F. Kerr and M. Zimmerman. U. S. pat. 1,709,133, April 16, 1929.—The stock is passed through a primary shredder consisting in a cylindrical housing having spaced shredder bars in its bottom portion and revolving pivoted hammers to coact with the shredder bars. The pulp material is discharged from the primary shredder to a rotating perforated screen, open at both ends, and the material passing out at the discharge end of the screen drum is sent to a secondary shredder similar in construction to the primary shredder.—A. P.-C.

Process for the Production of Cellulose. Otto C. Strecker. U. S. pat. 1,705,424, March 12, 1929.—Vegetable fibers, such as those of resinous woods, straw, or bamboo, are decomposed by boiling in a solution of a metallic compound of a soluble hydroxy compounds of the isocyclic series, such as sodium cresolate, naphthols, cylohexanol, or oxysulfones.—A. P.-C.

Recovery of Pure Pulp, with the Production of Fertilizing Substances from the Liquors. Charles Harnist. Ger. pat. 469,373. August 9, 1920. The process consists essentially in treating cellulose raw material with gaseous ammonia or soluble ammonium salts, at elevated temperature and pressure, extracting the dissolved substances with hot water, after driving off the ammonia, and treating with a solution of SO_2. The NH_3 driven off is returned to the process. The SO_2 solution is prepared by passing the gas into the hot wash water from the NH_3-treated pulp, the dissolved substances in this water being thus precipitated and removed. Colloidal materials or $Al_2(SO_4)_3$ may be added to aid in this pptn. The precipitated material has a value as fertilizer and for other purposes. The waste liquor and wash water from the SO_2 treatment are treated in a similar manner with NH_3. The above procedure applies to woods rich in alkali-soluble substances such as resins; for woods contg. much tannin the SO_2 treatment is given first, followed by NH_3. —R. H. D.

Beating

Treatment of Hydrated Cellulose. I. G. Farbenindustrie A. G. Eng. pat. 278,648, Sept. 13, 1927.—In order to diminish the tendency of hydrated cellulose to swell, it is immersed in or saturated with a neutral or weakly alkaline aqueous solution of a condensation product, e.g., sulphurortho-cresol resin, or the materials which can react to form such a product, with or without a catalyst. A further condensation is then brought about by addition of a substance such as formaldehyde with the formation of a product insoluble in water and dilute alkali.—A. P.-C.

Pulp Beating Engine. J. White. D. H. Thomson and H. Milne. Eng. pat. 301,648.—In beating engines having a beater roll cooperating with the two or more bed plates, separate feeding channels and separate discharge channels are provided for

each plate, the trough being divided into two parts by an elongated backfall, the channel being let into the backfall and the material under treatment traveling to each of the feed channels through passages situated within or without the walls of the trough. The roll may be adjusted to the bed plates, or the latter may be adjusted by mechanical or fluid pressure.—A. P.-C.

Mill. F. E. Marcy. U. S. pats. 1,690,493 to 1,690,496, Nov. 6, 1928.—These patents cover various features of the Marcy rod mill.—A. P.-C.

Chlorine for Slime in Paper Mills. W. L. Savell. Mathieson Alkali Works. Paper Mill 52, No. 16, 24-26 (April 20, 1929).—A discussion of the merits of the use of chlorine in eliminating slime troubles in pulp and paper mills, giving examples of a number of mills where it is used successfully for this purpose.—A. P.-C.

Beating Under Control. Arthur B. Green. Paper Trade, J. 88, No. 15, 57-58 (April 11, 1929).—The Green beater drag was developed with a view to controlling the action of the beater by measuring the change which it effects in the stock instead of by measuring the adjustment of the beater roll as is generally done at the present time. The principle of the instrument consists in immersing a specially-shaped object of smooth surface to a given depth in the stock and measuring the amount of power required to rotate it at constant speed under known temperature and consistency conditions. The instrument has now been perfected and simplified by replacing the recording wattmeter by a torsion dynamometer and designing it so that it can be bolted to the curb of the beater instead of spanning the tub from the midfeather to the curb. Results obtained in commercial beater runs are given to show the accuracy and sensitiveness of the instrument.—A. P.-C.

Hydrating Cellulose in a Jordan Engine. J. A. DeCew assignor to Process Engineers, Inc. U. S. pat. 1,704,533, March 5, 1929.—Cellulose is hydrated in a jordan by thickening the stock to a consistency of over 4 per cent and forcing it through the engine.—A. P.-C.

Bleaching

Temperature of Bleaching vs. Strength of Fiber. Wilfred V. Torrey. S. D. Warren Co. Paper Industry 11, 248-249 (May 1929).—The results obtained showed that varying the temperature of bleaching from 25 deg. to 50 deg. C. has practically no effect on the bursting and tearing strength of the bleached fiber.—A. P.-C.

Bleaching Chemical Wood Pulp. Linn Bradley and Edward P. McKeefe. U. S. pat. 1,705,897, March 19, 1929.—Wood pulp such as that produced by cooking wood with alkaline solutions is treated with a dilute acid such as 0.5 to 1 per cent hydrochloric acid solutions and then with an alkaline hypochlorite solution.—A. P.-C.

Paper Bleaching. George A. Richter and Milton O. Schur assignors to The Brown Co. Can. pat. 286,463, Jan. 15, 1929.—Wood chips are digested in a sodium bisulphite liquor having a combined and a free sulphur dioxide content of about 4 per cent each. The pulp is then treated at a stock density of about 10 per cent with chlorine water containing about 1.5 to 4 per cent chlorine based on the dry fiber weight. The treatment is carried out at room temperature and for about 30 min. The pulp is washed and bleached at a stock density of about 10 per cent in a solution containing 5 to 10 per cent sodium or calcium hypochlorite and about 0.5 to 2 per cent caustic soda based on dry fiber. The treatment is at room temperature or a temperature of 100 deg. to 110 deg. F. until the fiber is brought to substantial ultimate whiteness. The treatment does not injure the paper-making characteristics.—A. P.-C.

Method of and Apparatus for Bleaching Paper Pulp. J. Ruths assignor to Ruths Accumulator Aktiebolag. U. S. pat. 1,700,647, Jan. 29, 1929.—Steam generated in uniform quantity is accumulated in a storage container and substantially the entire volume of stored steam is then supplied to a bleaching beater containing pulp.—A. P.-C.

Sizing

The Importance of Alum in Paper Manufacture. Helmer Roschier. Paper Maker and Brit. Paper Trade J. 77, 274-277 (March 1, 1929).—Sizing of paper cannot be accomplished as effectively with acids and acid salts as with alum, since this phenomenon depends not only upon the degree of acidity but also upon the fact that alum hydrolyzes, producing the colloidal hydroxide, which is absorbed on the fiber, thus fixing the size and color.—A. P.-C.

Paper Sizing Process. E. Lecocq. Belg. pat. 351,917, July 31, 1928.—Sizing is carried out by means of a mixture containing an adhesive and a filler containing 1 part of aluminum sulphate and 2 to 3 parts of sodium bisulphate.—A. P.-C.

Control of Sizing Material Losses. E. Frank Whittington. Paper Industry 11, 68-72 (April, 1929).—A detailed account of an investigation which was carried out to trace the source of a considerable descrepancy between the size and alum consumption of a mill as obtained from purchasers and inventories, on the one hand, and beater room reports, on the other, and which showed that the discrepancy was attributable to carelessness and inaccuracy in measuring solutions going into the beaters.—A. P.-C.

Further Experimental Facts Connected with Rosin Sizing. S. R. H. Edge. Paper Makers' Monthly J. 67, 50-53 (Feb. 15, 1929).—Results are given of experiments on the relation between pH value of the stock and degree of sizing. When the pH value was controlled by adding successive amounts of 5 per cent alum solution after adding the rosin, maximum sizing was obtained at a pH value of 5.0; when 75 cc. of alum solution was added after the rosin and the pH value was then adjusted with 5 per cent caustic soda or 3 per cent sulphuric acid, maximum sizing was obtained at a pH value of about 4.0. There is much more rapid falling off in the sizing with acid in excess of what is required to that which occurs when alum in excess of what is required to obtain maximum sizing is added. It was found that in the laboratory the easiest way to get the highest comparative sizing figures is to add the rosin, then bring the stock to pH of 5.0 with acid and then add alum 5 or 10 cc. at a time and make a series of sheets. Addition of an excess of rosin over that required to obtain the full sizing effect acts like loading and reduces the sizing. With laboratory-made sheets, 85 appears to be the maximum possible comparative sizing figure; in the case of mill-made paper, with rosin contents up to 4 per cent and different beating and calendering conditions, only 2 cases were discovered higher than 85 (93 and 86), which seems to indicate that this figure may have a real significance. For mill-made waterleaf rag papers, the maximum appears to be 20, and the average 10 to 15. Comparative sizing tests carried out on pulp as received, after treating with sulphuric acid and after treating with alum, to determine the effect, if any, of adsorbed alum, did not show any difference in comparative sizing. Thiriet and Delcroix have developed the theory that rosin particles are attached to the fiber surface by electrical attraction in any solution at a pH value between those of rosin and cellulose; the role assigned to the alum is that of a buffer salt maintaining the pH value within that suitable for sizing. This theory requires that other salts which buffer a solution at the pH values from which alum readily gives sized sheets should also be sizing agents, and also that the retention of rosin should be greater within the sizing range of pH values. Using a mixture of sodium acetate and acetic acid to buffer the solution and adding acetic acid slowly to vary the pH value right through the usual sizing range failed to produce a single sized sheet; the rosin contents of the series of sheets made at different pH values were invariably the same within the errors of determination, wether the sheets were sized or not. The theory thus falls completely to the ground. Ac-

cording to the literature, the range of pH values produced by adding alkali to thorium sulphate solution is very close to that given by alum, the buffering action being slightly on the acid side of that given by alum. Sizing experiments with thorium sulphate gave a maximum comparative sizing of 42.5 (instead of 85 as with alum), and from 4 to 5 times as much thorium sulphate as alum was required to give the maximum. Chromium, iron and sodium sulphates were tried at various pH values, but entirely without success. The results re considered to justify the conclusion that, under the conditions of the experiments, there is a peculiar efficiency about alum as a sizing agent not possessed by any other metal, and not due to its buffer action, alone its valency alone, or its very weak basicity. It seems to be a property of the metal rather than of the salt, since the chloride dissolved in water or the acetate dissolved in acetic acid are just as effective as the sulphate.—A. P.-C.

Size. G. Hönsch. Fr. pat. 637,476, July 11, 1927.—A size powder soluble in cold water consists of a mixture of finely divided animal glue and liquefying agent such as sodium alpha-naphthosulphonate, sodium salicylate, sodium chloride, calcium chloride or calcium nitrate. The adhesive properties may be increased by tanning agents, siccatives or casein.—A. P.-C.

Oxidized Petroleum Wax Products for Use in Sizing Papers and Waterproofing Strawboard. A. W. Burwell assignor to Alox Chemical Corporation. Eng. pat. 287,514, March 23, 1927.—Emulsions suitable for use in sizing paper and "proofing" permeable materials such as strawboard, are made from oxidized petroleum wax which may be prepared by supplying the wax to an oxidizing cylinder having a steam coil and a pipe for admitting compressed air and effecting oxidation under pressure at 100 deg. to 155 deg. C. in the presence of a catalyst such as manganese oleate or other suitable manganese, copper or iron compound until about 30 per cent of the material is oxidized to acids.—A. P.-C.

Alkaline Processes

Causticing Waste Liquor. John S. Bates, Harris S. Chalmers and Percival C. Austin. Can. pat. 286,169, Jan. 1, 1929.—Alkali metal carbonate green liquor of kraft or soda pulp mills is treated in successive portions first with the sludge remaining from treatment of a previous portion and containing calcium hydroxide in amount less than the molecular equivalent of the sodium carbonate present in the portion with substantially complete conversion of the calcium hydroxide, and then is treated with fresh calcium hydroxide in amount substantially molecularly equivalent to the original sodium carbonate content of the liquor. The sludge resulting from the second treatment and containing unconverted calcium hydroxide serves for the preliminate treatment of the succeeding portion; thus the excess of calcium hydroxide used in treatment of the first portion is in effect transferred to successive portions and represents the total excess of lime used in treatment of an indefinite amount of liquor.—A. P.-C.

Recovery of Dissolved or Suspended Substances. Wm. Barrs and Edward Barrs. Fr. pat. 643,102, Oct. 5, 1927.—Suspended or dissolved substances such as caustic alkalies in black liquor are recovered by subjecting the liquor directly in a scrubber to the action of a gaseous evaporating agent such as flue gases coming from incineration operations of the process. A suitable apparatus is described in the specifications.—A. P.-C.

Elimination of the Lignified Portion of Flax by Chemical Means in the Manufacture of Cellulose. L. de Pestele and A. Dujardin. Belg. pat. 353,112, Oct. 31, 1928.—The material is cleaned, cut, heated to 100 deg. C. in a weak alkaline solution, pressed, subjected to intimate contact with chlorine gas, washed with cold water, heated to boiling in a solution of antichlor, made alkaline, and washed with boiling water.—A. P.-C.

Preparation of Sodium Sulphite Cooking Liquor—L. Bradley and E. P. McKeefe assignors to Bradley-McKeefe Corp. Can pat. 285,597, Dec. 11, 1928.—Residual liquor from the production of pulp with a cooking liquor containing essentially sodium sulphite, with or without caustic alkali, is treated either before or after concentration, and while alkaline in reaction, with calcium sulphite to give a precipitate of calcium sulphite and sodium sulphate in solution. The resulting solution is concentrated, sodium sulphate crystallized therefrom and a solution of the sodium sulphate is caused to react with the precipitated calcium sulphite in the presence of a sufficient quantity of acid to give a precipitate of calcium sulphate and a solution of sodium sulphite for re-use in the pulp-making process.—A. P.-C.

Treatment of Sodium Sulphite Waste Liquor. P. A. Barbou assignor to Société Barbou et Cie. Can. pat. 285,952, Dec. 25, 1928.—The waste liquor from the boiling of vegetable matter with sodium sulphite is treated with lime at 75 deg. C. in an open or closed container. The mixture so formed is agitated and then allowed to stand. After leaving the mixture for 30 min. the liquid supernatant on the precipitate is drawn off and transferred to a further open or closed container. The correct amount of calcium bisulphite solution is added to the liquor. The mixture is then agitated for a few min. and allowed to stand. After an hour the clear supernatant liquid is drawn off and neutralized with caustic soda to obtain a solution of sodium sulphite which may be used for further cooking operations.—A. P-C.

Treating Sodium Sulphite Waste Liquor. Linn Bradley and E. P. McKeefe assignors to Bradley-McKeefe Corporation. U. S. pats. 1,702,586 to 1,702,589, Feb. 19, 1929.—*No. 1,702,586*—Liquor from cooking pulp with sodium sulphite with or without the use of caustic soda, is evaporated to dryness and calcined to drive off sulphur compounds. The residue left is high in sodium carbonate and also contains sodium sulphite; it may be bleached and sulphited. *No 1,702,587* specifies calcining under conditions which avoid oxidation or reduction of the sodium sulphite. *No. 1,702,588* specifies producing carbonate from the sulphite in the evaporation and calcination. *No. 1,702,589* specifies producing caustic alkalin by calcining the evaporated liquor, heating the residue in an electric furnace to produce a product containing alkali metal carbide and treating this product with water.—A. P.-C.

Cellulose Sugar Cane Bagasse. E. C. H. Valet. Eng. pat. 287,516, March 23, 1927.—In a process such as that described in Eng. pat. 277,163, the entire treatment is carried out within a single container. Numerous details are given in the specifications.—A. P.-C.

Production of Wood Cellulose. E. Hägglund. Eng. pat. 292,534, June 21, 1927.—In order to obtain cellulose of good strength and in good yield from woods such as pine and beech, they are boiled with alkali just long enough to separate the fiber, and are then treated with chlorine by which hydrochloric acid and lignin chloride, which is soluble in water and alkali, are produced. Bleaching powder is then added and reaction effected with stirring and the material is washed with water and alkali. The treatment with chlorine and hypochlorite may be carried out in stages.—A. P.-C.

Process for Pulping Straws and Similar Materials. B. Dorner assignor to W. J. Day, assignor to Euromerican Cellulose Products Corp, assignor to Cornstalks Products Co., Inc. Fr. pat. 644,599, Oct. 28, 1927; Can. pat. 284,755, Nov. 13, 1928.—Pulp is produced from straw-like materials by subjecting the uncooked material to a combined washing and disintegrating process, the disintegration being carried to a point where the cell structure is sufficiently opened up to permit ready access to wash waters, but insufficient to form a pulp which substantially retains dirty water, further disintegrating the material and further subjecting it to a chemical pulping process by two alkaline cooks, the first with an amount of alkali just sufficient to unite with the silica present, and the second with a larger amount of alkali sufficient to substantially remove noncellulosic material, both cooks being carried out at temperatures which are not high enough to effect far-reaching decomposition of the non-cellulosic organic materials, such as caramelization of carbyhydrate materials.—A. P.-C.

Section of the

COST DEPARTMENT

of the

American Paper and Pulp Association

Edited by T. J. Burke C. A. Director Cost Dept.

Ratios as a Guide to Management in the Pulp and Paper Industry*

By Thomas J. Burke, C. A., Director, Cost Dept. A merican Paper & Pulp Assn

A "ratio" is a quantitative relation between two similar magnitudes determined by the number of times one contains the other integrally or fractionally. I didn't think that one up—I read it in a dictionary. I tried the same trick with "management," figuring everybody knows what a "guide" is, but it didn't work so well. What does "management" mean? We know that the verb "to manage" means to conduct, to handle, to take charge of, but all these meanings seem to fall short of what is signified by "management" today. You can take charge of a mill, you can handle or conduct it, but you may not necessarily "manage" it. If you really manage it don't you get the best possible production and profit from the mill? If you don't do this, you are not "managing" the mill, you are merely conducting it.

Needs Every Assistance

The manager of a pulp or paper mill today needs every assistance he can get from his departmental managers not only verbally but mainly by coordinated reports. The particular phase of these reports that I wish to speak of today is the use of ratios in their preparation. What the manager is particularly interested in, for instance, is not how much raw materials were used but what the percentage or ratio was of the raw materials used to the finished paper produced. It's no use saying we used so many tons of pulp unless you add the information that so many tons of paper were produced. The ratio between the two provides the information that counts.

The more I dug into and considered this subject, the more I realized that my opinion is correct, viz., that the setting up and working out of ratios for an industry is work, that can provide the "boot-straps," whereby the industry can lift itself out of the morass of unprofitable business.

The Only Way Out

That's about the only way we can get out. We have got to lift ourselves—and do it legally. I heard one man say, that just as soon as most men entered into a "gentleman's agreement," they ceased to be "gentlemen." I believe that's true, when applied to price-fixing. We all know that at the crucial time such agreements usually fall. Of course, I'm talking about other industries. We learned our lesson in the pulp and paper industry years ago, and with us such agreements are things of the past. I only refer to them because that seems to be the only other plan that might be suggested to cut out unprofitable business and production.

You cannot call "eliminating the unfit" a plan, because they are not eliminated; they are merely "taken over" by somebody else as you well know, so if we want better times we've got to work on a definite plan and I want to suggest to the pulp and paper industry this "ratio plan as a guide to management," for I have now been long enough with the industry to believe in the fundamental common-sense and fairness of its major executives. If they can get the facts they will then take the action necessary to adjust their businesses, so as to place our industry on a sound economic basis. It's up to us to help them get the facts. We can then get some joy out of living, which reminds me of a story of Carlisle, who went to see a neighbor one time and said, "Sir, you will have to sell your game-cocks; they keep me awake." "Why," his neighbor replied, "There are only three of them and they each crow every three seconds. What is nine seconds' suffering to a strong man?" Carlisle replied, "Sir, you don't know what I suffer waiting for the darn things to crow." I guess that's how it is with our executives, we don't know what they suffer, waiting for these darn prices to improve.

Manufacturing Operations

Well, now what about these ratios? First of all I want to refer to "A Basis for Evaluating Manufacturing Operation," a paper prepared by L. P. Alford and J. E. Hannum and read before the American Society of Mechanical Engineers, last year. They suggested the following factors and methods of expressing them:

FACTOR	HOW EXPRESSED
Productivity	Physical volume of product per 1,000 man-hours.
Labor Permanence	No. of workers employed per 1,000 man-hours.
Fixed Capital Investment	
Buildings	Investment in dollars per 1,000 man-hours.
	Square feet of floor area per 1,000 man-hours.
Machinery & Equipment	Investment in dollars per 1,000 man-hours.
Primary Power	Horse-power utilized per 1,000 man-hours.
Industrial Accidents	
Frequency	No. of lost-time accidents per 1,000 man-hours.
Severity	No. of working-hours lost per 1,000 man-hours.
Costs	
Material Cost, Wages, Prime Cost, Overhead Charges, Manufacturing Cost	Dollars per 1,000 man-hours.
Profit	
Manufacturing, Net	Dollars per 1,000 man-hours.

Of course, a "1,000 man-hours" is computed by totaling the number of hours worked by all employees and dividing by 1,000.

I am not going to take you all through that interesting and excellent paper, but I am going to give you some information they compiled about our industry. Here it is:

* Presented at meeting of Kalamazoo Div. of Cost Dept. of American Paper & Pulp Assn., Kalamazoo, Mich., May 24, 1930.

TABLE 1
PHYSICAL VOLUME OF PRODUCTION PER 1,000 MILL MAN-HOURS

	No. of companies	No. of employees	No. of mill man-hours worked	Production rate per mill 1,000 man-hours
Boxboard	5	3,303	8,826,036	27.21 short tons
Corrugated cartons	5	806	2,079,849	63.50 short tons
General	24	12,551	34,801,749	29.80 short tons
Wrapping paper	6	1,477	3,834,587	19.70 short tons

TABLE 2
VALUE OF PRODUCT PER 1,000 MILL MAN-HOURS

Industries	No. of companies	No. of employees	Value per 1,000 man-hours
News print	3	6,158	$3,020.00
Paper and pulp	50	28,832	2,825.00
Wrapping	6	1,477	2,190.00
Boxboard	5	3,303	2,180.00
Book	3	2,332	1,950.00
Writing	4	2,211	1,000.00

Taking the Paper and Pulp group (50 companies, see above), they figured the following:—Wages per 1,000 man-hours, $465 and cost of materials per 1,000 man-hours $1,760, making the total prime cost $2,225.00. The value added by manufacture was said to be $1,065 per 1,000 man-hours, the overhead selling expense and profit being $600 per 1,000 man-hours, while the value of product per 1,000 man-hours was, as stated above, $2,825.

Now, I believe, that if such figures were produced periodically by the Cost Department of the American Paper and Pulp Association they would, as the authors state, provide a real basis for evaluating the manufacturing efficiency of the various mills in each group. In concluding their paper, the authors said:—

In order that American Industry may continue to progress,

1—Those *plants* having low operating factors, as shown by the man-hour basis, must be upgraded until their records are substantially equal to the average of their product group.

2—Those *industries* that have the lowest factors must be upgraded until they substantially equal in performance with other industries that are making a satisfactory manufacturing profit.

The most potent attacks that can be brought to bear upon this problem of upgrading are in the reduction of waste, lowering of cost and improvement of processes, equipment and methods.

I have not given you the figures for other industries, but only those relating to our own industry or those closely related to it and feel sure you'll agree that these are sufficiently interesting and instructive, to warrant us in collecting this data, which would undoubtedly prove a wonderful guide to management if such figures can be collected from a majority of the mills in each group in our industry.

An Analysis of Total Costs and Expenses of 44 Mills

In 1928 we made an analysis of Total Costs and Expenses of 44 mills, and a report was sent to each of the cooperating mills. These percentages were compiled for the first six months of 1928 They represent the ratio or percentage of the various items shown to the total cost of manufacturing and selling the paper produced, during that period. Here they are:—

	Board	Book	Cover	Sulphite Bond	Tissue	Wrapping	Writing	Average
Manufacturing materials and supplies	56.36	58.26	53.80	59.93	56.43	57.93	53.04	56.54
Repair materials and supplies	2.66	3.07	3.15	2.14	4.18	3.02	2.92	3.02
Power materials and supplies	6.38	4.84	2.76	5.57	5.24	7.27	3.85	5.13
Purchased power	1.08	.89	4.49	.65	2.16	1.43	2.21	1.84
Manufacturing wages and salaries	14.12	13.04	15.14	13.10	13.34	12.84	17.57	14.16
Repair wages and salaries	1.68	1.13	1.44	1.67	1.82	1.90	1.31	1.56
Power plant wages and salaries	1.93	1.74	1.31	2.13	1.67	1.68	2.53	1.86
Administrative and office expense	4.01	4.60	5.57	3.68	4.54	4.54	5.23	4.60
Selling expense (including advertising)	2.30	4.90	6.66	4.26	2.92	2.03	5.09	4.02
State and local taxes	1.08	.97	1.25	1.73	1.40	.77	1.35	1.22
Insurance, depreciation and other general expenses	8.40	6.56	4.43	5.14	6.30	6.59	4.90	6.05
Total costs and expenses (exclusive of profit), per cent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of mills reporting	8	5	4	6	5	8	8	44

I think that also would be a worth while compilation for each group in the industry. I intend to send out a similar questionnaire covering the year 1929. You will note particularly, that manufacturing materials, supplies, wages and salaries make up approximately 70 percent of the total in every group. You will also note that the highest "Selling Expense including advertising" amounts to only 6 2/3 percent, while the lowest is only just over 2 percent. That leads me to ask the question not whether we are spending too much in selling our products, but whether we are spending enough. I am not suggesting more intensive selling, but more expert selling—Are we using enough of our own product in our selling? In other words, are we adequately advertising our paper, its quality and uses? Taking these 44 mills as a whole, our average selling expenses, including advertising are just over 4 percent of our total costs and expenses, or less than 4 percent of our selling price.

Analysis of Sales Dollar

In addition to the above analysis, we also made an analysis at one time in the Cost Association, of the Sales Dollar, the difference being of course, that this included any Profit made. This analysis was based on 1926 Gross Sales. Thirty-seven mills sent in their figures and these are the "average" percentages:—

	Per cent
Gross sales	100.00
Deductions from sales	3.38
Net sales	96.62
Raw materials	49.01
Supplies	7.78
Labor	14.44
Repairs	3.52
General, including taxes, insurance and depreciation	6.99
Administrative expenses	3.58
Selling expenses	3.60
	88.92

From this it appeared that the average Net Profit made by these 37 mills in 1926 was 7.7 per cent. You will note that the raw materials, supplies and labor totalled about 71 per cent, while selling expenses amounted to 3.6 per cent.

Labor Turnover Ratios

Because labor is our second most important cost item labor turnover ratios should be helpful to management. Training new men is expensive, also it has been proved that in many cases more men are retained on the pay-roll, than are necessary, because of of the necessity of having a reserve to take the place of absentees. Past compilations show that the average labor turnover in our industry varies between 40 per cent and 50 per cent. There's about an even break between our skilled and unskilled employees, that, is in every 100 men employed about 50 are skilled or semi-skilled and 50 unskilled. I mention this because, of course, the turnover in the unskilled is much greater than in the skilled. In a mill where the annual labor turnover is 45 per cent, I would say the annual skilled labor turnover rate would be about 15 per cent and the unskilled about 30 per cent, which is just double the "skilled" rate as the number employed in each class is generally approximately equal. I believe such figures compiled semi-annually would be a really helpful guide to management, for I am only talking averages and there are big variations between the mills. Some of them have an annual labor turnover rate of less than 15 per cent for all employees, a decrease of 30 per cent below the average. These mills must benefit greatly through savings made in training new men and in improved efficiency gained from having the same employees working together over long periods of time. Moreover, a high turnover rate surely signifies there must be something wrong with working conditions, unless due to periodical employment of labor gangs for special work. We believe it advisable in any event, that the facts should be investigated and brought to the attention of the management, periodically for review, so that if possible, some way may be found of smoothing out the curve of employment.

Before leaving the subject of "Labor Turnover," I want to quote

the "Voluntary Quit" rates in American factories as reported by the United States Bureau of Labor Statistics for the years 1919 to 1928 inclusive:—

Year	Per cent	Year	Per cent
1919	69.7	1924	32.0
1920	100.9	1925	37.0
1921	26.7	1926	34.4
1922	51.0	1927	25.6
1923	74.9	1928	25.8

Our "Voluntary Quit" rate for 1928 was approximately 25 per cent, a little less than the figure shown above for that year.

Financial Percentages

I believe it's a fair statement to say *that nearly a third of the corporations in our industry are losing money.* The statement is based on income tax returns for 1927 and 1928. It's almost exact for the latter year on returns filed up to August 31st, 1929—1286 reported a net income and 642 reported no net income—one more in the latter and it would have been exactly 2-1.

Although, in that respect, *our industry showed up better than any other industry in both years,* it's not a record to be proud of. We can and should take measures to cut out this unprofitable business and the only way I can see to do it is, by having a better informed management, which will watch its ratios and percentages, when it is satisfied that these are compiled on a sound basis, and use them as a guide in conducting its business. I believe that if each group had the benefit of the use of properly compiled financial ratios, these would prove very helpful to those 642 executives.

While examining the figures again for both years, I noted a strange coincidence, viz that the number of corporations reporting no net income was 642 in each case. Apparently they weren't exactly the same corporations but a study of the figures makes it fair to assume that the bulk of them were the same. These corporations sell over $250,000,000 worth of paper and paper products annually and in 1927 lost $24,000,000 (9.53 per cent). Basing my opinion on a previous survey, I should say there must be a total investment in those corporations at least equal to the annual sales viz—$250,000,000. It's clear that the management in each case is at fault somewhere and needs a guide. Well, here's the guide, the whole trouble shows up quite plainly in the "Gross Profits from Sales" figure for 1927 (I haven't got this yet for 1928).

	Corporations reporting net income		Corporations reporting no net income	
No. reporting	1,386		642	
	Amount	Per cent	Amount	Per cent
Gross sales	$1,341,846,975	100.00	$254,435,084	100.00
Cost of goods sold	979,709,542	73.01	213,540,945	83.93
Gross profit from sales	$362,137,433	26.99	$40,894,139	16.07

To me it seems quite plain that there is the answer, for you will see the corporations reporting no net income showed a *Gross* Profit of only 16.07 per cent which is 10.92 per cent *less* than the profit-making ones. Evidently their selling prices were not based on their costs, for if their ratio of gross profit had been equal to that made by the profit-making corporations instead of losing 9.53 per cent they would have made a profit of 1.39 per cent. We ask at once, why did they sell their paper so cheap? Was it really competition that forced them to do this or was there another pressing reason? I rather suspect there was, because of another ratio, viz—the ratio of "interest paid." It is very significant, isn't it, that the successful corporations paid $1.49 interest for every $100 gross sales while the others paid *$3.90 for every $100 gross sales,* an increase of $2.41. In my opinion, that signifies that many of these 642 corporations were borrowing fairly extensively and therefore that their financial standing in most cases was not very strong. Being pressed for funds, *they were thus forced to dispose of their paper to meet their liabilities and cut their prices to get the funds to do this.* Thus we come to the question whether they are adequately financed and the answer would appear to be "No." There is one way to determine this and that is to work up a set of Financial Percentages for the industry. If we can get the necessary cooperation from the industry there is no reason why this cannot be done, and I strongly recommend that it should.

You will remember that some years ago the Cost Association did a lot of work on "Balance Sheet Ratios." Basing my opinion on those figures and on figures collected by the Writing Paper Manufacturers Association since that time, kindly made available by Emmett Naylor, I am going to attempt to set up an ideal "Balance Sheet" in ratio form. When I say ideal, I mean rather a Balance Sheet representing a fairly sound financial position for our industry also the resulting ratios:—

ASSETS	Per cent
Cash	10.00
Receivables (net)	8.50
Inventories	20.00
Investments	7.50
Miscellaneous	1.00
Total current assets	47.00
Fixed assets	50.00
Deferred charges	3.00
Total assets	100.00
LIABILITIES	
Current liabilities	15.00
Fixed liabilities	10.00
Total liabilities	25.00
Net worth	75.00
	100.00

Here's what the resulting ratios would be with a balance sheet like that:—

1—Current assets to current liabilities	3.13 to 1
2—Inventories to receivables	2.35 to 1
3—Net worth to fixed assets	1.5 to 1
4—Net worth to fixed liabilities	7.5 to 1
5—Net worth to total liabilities	3 to 1

Then, assuming a ratio of Sales to Net Worth of 1.33 to 1, or in other words, $100 sales to every $75 Net Worth, we arrive at these additional ratios.

6—Sales to receivables	12 to 1
7—Sales to inventories	5 to 1
8—Sales to fixed assets	2 to 1
9—Sales to net worth	1.33 to 1

Now, I believe if we should set up some guide to management like that, it would be very helpful. As I stated above, that is not an ideal Balance Sheet, but it is one that will leave a fair margin of safety. It's my opinion that, of course, each mill should compile a monthly or better still four-weekly statement of profit and loss, also balance sheet with the respective ratios or percentages shown against the figures. If this be done regularly, management will undoubtedly study the ratios and guide itself accordingly.

Raw Materials and Supplies

Getting reliable figures on which to base percentages of costs of raw materials and supplies entering into cost of manufacturing a ton of paper of any kind, is a problem. I was talking to Ronald Macdonald of the Technical Association about this, and he said he thought the figures quoted by Royal S. Kellogg, of the News Print Service Bureau, were the most reliable available. Here are some Proportionate Costs quoted by Mr. Kellogg as representing the cost of a ton of news print excluding administrative, selling and fixed charges:—

	Per cent
Wood (prepared)	45
Steam and power	21
Labor	13
Repairs	7
Finishing and shipping	6
Wires and clothing	4
Sulphur	2
Stones	¼
Alum, color, etc.	¼
Limestone	½
	100

The following are all quotations from Mr. Kellogg's address:—

1—Slashing, barking, piling and rehauling (prior to reaching grinders and chippers), may easily cost $2.00 per ton of paper, without counting interest on investment in wood pile.

2—Pulpwood is a perishable raw material and even a 1 per cent loss in a typical wood-pile may amount to 16 cents per ton on the paper it would have made.

3—In their barking operations two mills handle approximately the same quantity of wood. One uses 2.9 men per eight hour shift for each 100 cords of wood barked and the other uses 9.6 men for the same result or 3.3 times the number of men in the other mill.

4—Two mills slash approximately the same quantity of wood in eight hours. One uses 3.2 men and the other 8.1 men for eight hours for each 100 cords slashed, that is one mill uses 2½ times the number of men to do the same work.

5—Most mills have no data of any scientific value upon amount of wood they use to make a ton of any kind of pulp . . . The weighing and moisture sampling of wood and chips will, I am sure, soon be standard practice, accepted by mill managers, instead of being scorned as the theory of an impractical college graduate.

6—I have a list of pulpstone costs ranging from 6 cents to 60 cents per ton of pulp.

7—It is within the range of reasonable practice to make sulphite with 2000 lbs. less steam per ton of pulp than the present average of 8000 lbs. This would mean a saving of about 75 cents per ton of pulp.

8—But let us get back to the present two or three roll 1000 to 1200 feet speed machines. One makes 11 tons of paper per pound of felts, and one ton per square foot of wires. Another makes 18 tons per pound of felts and 1½ tons per square foot of wires.

9—One mill uses 7000 lbs. of steam in the dryers per ton of paper, and another 10,000 lbs. per ton.

10—Steam costs an average of 38 cents per 1000 lbs. If we save 1000 lbs. we save from $38.00 per day up on one modern machine.

11—There are broke losses ranging from 2 per cent to 9 per cent. If we assume 4 per cent to be a reasonably attainable ratio, there are many mills which can greatly improve their operating efficiencies in this one item alone.

12—The total cost of labor in an integrated mill is between $4 and $5 per ton of news print, about eight man-hours per ton of paper, excluding electric and water power labor.

13—Repairs vary in old and new mills, but may average up to $2.50 per ton.

14—Really a part of this question of "water losses" is the amount of water used in the mill. In some places the quantity used in the paper mill alone amounts to 50,000 gallons per ton of product. On the other hand, a case is on record where a mill which had to buy its water at metered rates from a city, used only 2500 gallons per ton of paper—and made a satisfactory sheet too.

15—While much has been said about improvement in methods and machines, the human factor will always remain of great importance. An authority tells me, that of 140,000 men in the North American Paper Industry only 3000 are making any effective effort to improve themselves.

With that last quotation, I propose to end this rather long and perhaps rambling talk. I have endeavored to bring to your attention ratios which I believe, you and I, in cooperation should develop for our industry. I want to note particularly Mr. Kellogg's statements about the lack of reliable information as to quantities of materials, etc., used in news print paper-making. Are our records any more complete? The News Print Service Bureau as we all know, is a very efficient organization, yet they have their troubles in developing definite information. The fact is, we must have complete cooperation from our members. Management is becoming increasingly scientific and is now basing its decisions on facts rather than "hunches." There are many administrative or management problems which can be satisfactorily solved if the proper ratios are developed so as to bring out the necessary facts relating to them. The accountants can prove their worth by assisting in developing these ratios. I therefore, sincerely ask for your cooperation in the work that the Cost Department of the American Paper and Pulp Association proposes to do. Many of you are tried and true paper mill accountants and I believe will surely recognize the value of these ratios if placed along the road to "Profits" as sign-posts to management.

COST SECTION

Canadian Box Manufacturers Meet

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 24, 1930.—C. M. Prescott, of Toronto, was elected president of the Canadian Paper Box Manufacturers' Association at a successful annual convention of the organization held at the Chateau Frontenac in Quebec City last week. Mr. Prescott, a former director of the association, replaces J. J. Small, who has guided the destinies of the organization during the past year. T. A. Moisan, of Montreal, was elected vice-president and he replaces Mr. Frankish. Mr. Moisan was also a director of the association before he was elected to executive office by the convention. One of the directors, J. M. Hobart, of London, Ont., was relected to office to act with three other new officials. The three new directors elected are: J. J. Small, former president; G. Boehmer, of Kitchener, Ont., and F. W. Fisher. C. V. Hodder, the efficient secretary of the association with headquarters in Toronto, was reelected managing secretary.

Before the election took place two hundred of the members transacted the annual business and listened to reports reflecting a quiet but fairly satisfactory condition of business affairs within the organization. There were a number of interesting addresses. George S. May, Industrial Engineer, of Chicago; Walter E. Trum, past president of the National Paper Box Manufacturers' Association, and A. C. Picard, past president of the Quebec Board of Trade, delivered addresses on timely topics. Mr. May spoke on "Wage Incentive Methods," and the subject of "Federal Trade Commission Aids to the Paper Box Industry," was handled by Mr. Trum, while Quebec's ex-president of the Board of Trade spoke on "Merchandising Your Customers' Products."

While the active members were in session the ladies and associate members were taken on a sight-seeing drive in and around historic old Quebec and a visit to the Donnacona Insulated Lumber Company was also paid through the courtesy of Price Bros. & Co. Afternoon tea was served to the visitors at Donnacna. The annual banquet at the Frontenac was a brilliant affair, the guests being received by His Worship Mayor H. E. Lavigneur.

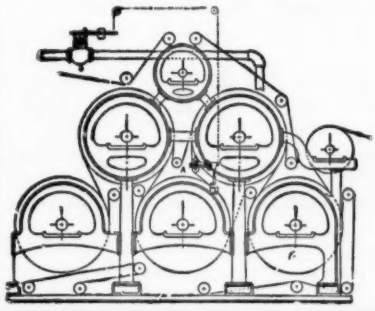
Boston Paper Market Conditions

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 23, 1930.—In view of general business conditions, statements of paper jobbers and a portion of manufacturers' representatives indicate that there is at least a fair demand and that in some cases a larger volume of merchandise is moving. With some handlers of fine paper business was very good during the last week. Wrapping paper continues to hold its own, and, like fine paper, is in at least fair demand, in some quarters quiet and in others somewhat improved. Interest in specialties, such as are usually in demand in this season of the year, continues. The demand for products of the industry in general might be greater but for the fact that some refrain from buying as far as possible on account of the June inventories. Quiet prevails in the box board market, although there are a few bright spots, with more promise for the future. While actual business is regarded as sub-normal, dealers look for a turn for the better by the middle of July or early August. Prices remain firm.

According to statements of dealers paper stock is in the worst condition ever. It is said in the market that some commodities cannot be given away. There is a glut of mixed papers, which continue quotable at .20. Book and ledger stock are rather weak. There is some demand for gunny and scrap burlap. Foreign manila rope has declined to 3.00 to 3.25, compared with a previous quotation of 3.25 to 3.50, and domestic manila rope is down to a flat 3.50 from a range of 3.75 to 4.00. Rag prices are largely nominal, although some declines are noted. Foreign dark cottons are now quoted at .90 to 1.00, against a previous price of 1.25, and old linsey garments at a flat 1.25, compared with a former value of 1.30 to 1.40. Animal sizing for fine writings is holding its own.

The Pickles Drying Regulator



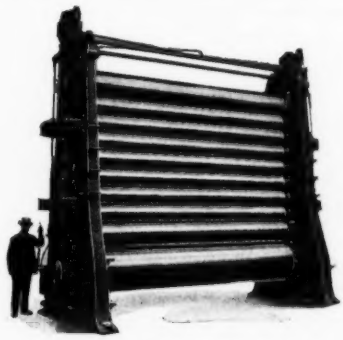
WE ARE SAFE IN OUR PROPOSITION

YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**



178" Stack with Hydraulic Lift

FARREL

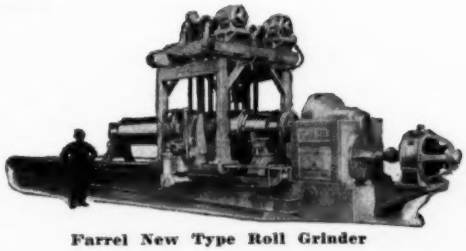
FARREL CALENDERS are equipped with Electric, Hydraulic or Ratchet Lift, all operated from the floor.

FARREL ROLLS are made in all sizes up to and including 298" face.

FARREL NEW TYPE ROLL GRINDER is electrically driven throughout, and is made in 24", 32", 36" and 42" sizes. All sizes are fitted with Geared Head, New Crowning Device, Automatic Lubrication, etc.

FARREL INDICATING ROLL CALIPER is a precision instrument, of very light weight, with which rolls can be calipered to the end of the face without reversing the instrument.

FARREL PRODUCTS are known all over the world.



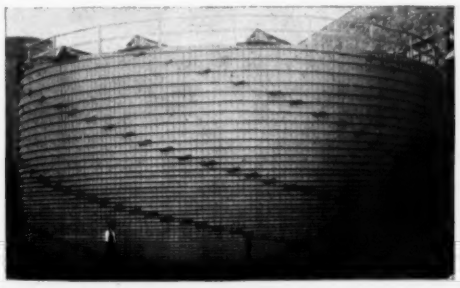
Farrel New Type Roll Grinder

Farrel Indicating Roll Caliper

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN.

Successor to: {Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848. {Birmingham Iron Foundry, Derby, Conn., Est. 1836.



Since 1854

Stuff Chests
Acid Storage Rubber Lined or Plain
Agitators
Water Storage
Riffle Boxes
Towers.

The largest Woolford Wood Tank for the Paper Industry, 486,000 Gallons.

G. WOOLFORD WOOD TANK MFG. CO.

PASCHALL PO PHILADELPHIA—Office and Factory—Darby, Pa.

The HARRINGTON & KING PERFORATING CO.

5652 Fillmore St. Chicago, Ill.

New York Office 114 Liberty St.

PERFORATED METALS

Screens of All Metals

For use in Pulp and Paper Mills

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 21, 1930

SUMMARY

Cigarette paper .....936 cs.
Wall paper .....15 bls., 18 cs.
Paper hangings .....35 bls., 12 cs.
News print .....1853 rolls
Printing paper .....128 rolls, 70 cs.
Wrapping paper .....93 bls., 51 cs.
Packing paper .....55 cs.
Drawing paper .....53 cs.
Filter paper .....159 bls., 208 cs.
Colored paper .....20 cs.
Decalcomania paper .....2 cs.
Coated paper .....275 cs.
Pigment paper .....2 cs.
Photo paper .....3 cs.
Silk paper .....4 cs.
Writing paper .....21 cs.
Bowl paper .....16 bls.
Miscellaneous paper ..681 rolls, 246 bls., 196 cs.

CIGARETTE PAPER

De Manduit Paper Corp., Pipestone County, Havre, 332 cs.
; Standard Products Corp., De Grasse, Havre, 37 cs.
Standard Products Corp., France, Havre, 59 cs.
Bush Service Corp., Olympic, Southampton, 1 cs.
American Tobacco Co., Roussillon, Bordeaux, 500 cs.
Liggett & Myers Tobacco Co., Roussillon, Bordeaux, 7 cs.

WALL PAPER

Schmidt & Pritchard, Europa, Bremen, 1 ble.
Gimbel Bros., Pipestone County, Havre, 1 cs.
Globe Shipping Co., G. Washington, Hamburg, 1 ble.
Schmidt & Pritchard, Berlin, Bremen, 2 bls.
F. J. Emmerich, Hamburg, Hamburg, 4 bls.
Irving Trust Co., Hamburg, Hamburg, 6 cs.
F. J. Emmerich, Arabic, Liverpool, 3 bls.
A. C. Dodman, Jr., Inc., Olympic, Southampton, 4 bls.
A. L. Diament & Co., Olympic, Southampton, 8 cs.
International F'd'g Co., Lisbon Maru, Yokohama, 3 cs.

PAPER HANGINGS

F. L. Kramer & Co., Aquitania, Southampton, 2 cs.
Whiting & Patterson Co., Inc., Aquitania, Southampton, 1 cs.
W. H. S. Lloyd & Co., De Grasse, Havre, 3 cs.
——, De Grasse, Havre, 2 cs.
J. E. Bernard & Co., Samaria, Liverpool, 1 ble.
W. H. S. Lloyd & Co., Minnetonka, London, 34 bls., 4 cs.

NEWS PRINT

Perkins, Goodwin & Co., St. Louis, Hamburg, 444 rolls.
Perkins, Goodwin & Co., Hamburg, Hamburg, 180 rolls.
Parsons & Whittemore, Inc., Berlin, Bremen. 407 rolls.
Parsons & Whittemore, Inc., Minnequa, Kotka, 822 rolls.

PRINTING PAPER

Whiting & Patterson Co., Inc., Aquitania, Southampton, 1 cs.
Keuffel & Esser Co., G. Washington, Hamburg, 53 rolls.
P. C. Zuhlke, Westernland, Antwerp, 32 cs.
Japan Paper Co., American Farmer, London, 16 cs.
Japan Paper Co., Olympic, Southampton, 1 cs.
Int'l. Madison Bank & Trust Co., Pr. Roosevelt, Hamburg, 20 cs.
Keuffel & Esser Co., Pr. Roosevelt, Hamburg, 75 rolls.

WRAPPING PAPER

Sylvania Industrial Corp., Westernland, Antwerp, 4 cs.
——, St. Louis, Hamburg, 13 bls.
Yardley & Co., Minnetonka, London, 8 cs.
T. Barret & Son, Drottningholm, Gothenburg, 80 bls.
Wilkinson Bros. & Co., Inc., Drottningholm, Gothenburg, 37 cs.
Houbigant, Inc., Olympic, Southampton, 2 cs.

PACKING PAPER

H. Harrison Co., Hamburg, Hamburg, 48 cs.
Gevaert Co. of America, Westernland, Antwerp, 3 cs.
F. L. Kramer & Co., American Farmer, London, 4 cs.

DRAWING PAPER

Keuffel & Esser Co., G. Washington, Hamburg, 23 cs.
Keuffel & Esser Co., Pr. Roosevelt, Hamburg, 30 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Carmania, London, 19 cs.
H. Reeve Angel & Co., Inc., Olympic, Southampton, 11 cs., 32 bls.
J. Manheimer, Olympic, Southampton, 120 bls.
C. Schleicher Schull Co., Hamburg, Hamburg, 7 bls., 21 cs.
E. Fougera & Co., Roussillon, Bordeaux, 152 cs.

COLORED PAPER

S. Gilbert, Berlin, Bremen, 9 cs.
Borden Riley Paper Co., Westernland, Antwerp, 11 cs.

DECALCOMANIA PAPER

C. W. Sellers, Europa, Bremen, 2 cs.

COATED PAPER

Globe Shipping Co., Berlin, Bremen, 272 cs.
W. A. Foster & Co., Minnetonka, London, 5 cs.

PIGMENT PAPER

Draeger Shipping Co., Pr. Roosevelt, Hamburg, 2 cs.

PHOTO PAPER

J. J. Gavin & Co., Olympic, Southampton, 3 cs.

SILK PAPER

Whiting & Patterson Co., Inc., Statendam, Rotterdam, 4 cs.

WRITING PAPER

L. Bamberger & Co., Pipestone County, Havre, 6 cs.
Guibout Freres, Olympic, Southampton, 9 cs.
——, Waukegan, Havre, 6 cs.

BOWL PAPER

Hurley Johnson Corp., Samaria, Liverpool, 16 bls.

MISCELLANEOUS PAPER

F. B. Vandegrift & Co., St. Louis, Hamburg, 5 cs.
Wilkinson Bros. & Co., Inc., St. Louis, Hamburg, 2 cs.
R. Wilson Paper Corp., Transylvania, Glasgow, 45 cs.
Gimbel Bros., De Grasse, Havre, 3 cs.
American Express Co., De Grasse, Havre, 100 cs.
Fidelity Trust Co., Hamburg, Hamburg, 287 rolls.
P. C. Zuhlke, Westernland, Antwerp, 1 cs.
Globe Shipping Co., Westernland, Antwerp, 2 cs
Keller Dorian Paper Co., France, Havre, 22 cs.
J. Beckhard, France, Havre, 11 cs.
Blauvelt Wiley Paper Manfg. Co., Drottningholm, Gothenburg, 13 bls.
The Borregaard Co., Inc., Drottningholm, Gothenburg, 86 bls., 362 rolls.
H. Reeve Angel & Co., Inc., Drottningholm, Gothenburg, 1 cs., 32 rolls.
Kramer & Co., Drottningholm, Gothenburg, 147 bls.
H. C. Davison Co., Lisbon Maru, Yokohama, 4 cs.

RAGS, BAGGINGS, ETC.

R. Bishop Manfg. Co., Pipestone County, Dunkirk, 45 bls. rags.
——, Pipestone County, Havre, 116 bls. bagging.
C. R. Spence, Transylvania, Glasgow, 96 bls. bagging.
——, Transylvania, Glasgow, 196 bls. paper stock.
Irving Trust Co., Transylvania, Glasgow, 48 bls. rags.
——, Maryland, Havre, 47 bls. rags.
W. Steck & Co., Drottningholm, Gothenburg, 40 bls. rags.
Banco Com'l. Italiane Trust Co., Exilona, Genoa, 286 bls. bagging.
Darmstadt, Scott & Courtney, Exilona, Genoa, 118 bls. bagging.
——, Exilona, Genoa, 42 bls. bagging.
Fidenity Trust Co., Exmoor, Bari, 55 bls. rags; 35 bls. bagging.
Irving Trust Co., Sud Argentino, B. Ayres, 60 bls. cotton cuttings.
M. W. Levinson, Sud Argentino, B. Ayres, 63 bls. cotton cuttings.
P. Garvan, Inc., Sud Argentino, Havana, 104 bls. rags.
——, Pr. Roosevelt, Hamburg, 66 bls. rags.
C. R. Spence, Exeter City, Bristol, 171 bls. rags.
E. Butterworth & Co., Inc., Anaconda, Antwerp, 241 bls. flax waste.
International Purchasing Co., Anaconda, Antwerp, 38 bls. bagging.
Royal Manfg. Co., Bellepline, Antwerp, 16 bls. rags.
Castle & Overton, Inc., Bellepline, Antwerp, 108 bls. bagging.
E. J. Keller Co., Inc., Bellepline, ——, 51 bls. rags.
Guaranty Trust Co., Waukegan, Havre, 70 bls. bagging; 60 bls. rags.
E. J. Keller Co., Inc., Waukegan, ——, 40 bls. new cuttings.
S. Godfrey, Waukegan, Dunkirk, 29 bls. rags.
E. J. Keller Co., Inc., Heina, ——, 260 bls. rags.
P. Berlowitz, Heina, Alexandria, 100 bls. rags.
1st National Bank of Boston, Heina, Alexandria, 153 bls. rags.
Castle & Overton, Inc., Heina, Alexandria, 69 bls. rags.
American Woolstock Corp., Carnia, Leghorn, 71 bls. rags.

OLD ROPE

Brown Bros. & Co., St. Louis, Hamburg, 34 coils.
Brown Bros. & Co., Transylvania, Glasgow, 40 coils.
——, Carmania, London, 53 coils.
Irving Trust Co., Hamburg, Hamburg, 61 coils.
Brown Bros. & Co., Westernland, Antwerp, 47 coils.
International Purchasing Co., Exilona, Genoa, 137 coils.
W. Steck & Co., Anaconda, Antwerp, 50 coils.

CASEIN

Kalbfleisch Corp., Western World, B. Ayres, 250 bags.

WOOD PULP

Bulkley, Dunton & Co., Consul, Olsson, ——, 8840 bls. wood pulp, 1768 tons.
——, Consul Olsson, Hernosand, 3300 bls. sulphite, 550 tons.
Polaris Shipping Co., Jan Country, Harbor, 925 cords wood pulp.
Guaranty Trust Co., St. Louis, Hamburg, 254 bls. sulphite, 51 tons.
——, St. Louis, Hamburg, 136 bls. sulphite, 27 tons.
Irving Trust Co., Berlin, Bremen, 330 bls. wood pulp.
Castle & Overton, Inc., Hamburg, Hamburg, 429 bls. wood pulp, 64 tons.
Pagel, Horton & Co., Inc., Minnequa, Hornefors, 1200 bls. sulphite, 200 tons.
——, Minequa, Kotka, 2294 bls. sulphite, 387 tons.
——, Minnequa, Kotka, 170 bls. sulphate, 28 tons.
Johanson, Wales & Sparre, Inc., Drottningholm, Gothenburg, 1250 bls. sulphate.
E. M. Sergeant & Co., Drottningholm, Gothenburg, 449 bls. dry soda pulp.
International Paper Co., Lifland, ——, 1100 cords wood pulp.
M. Gottesman & Co., Inc., Malmen, Stockholm, 1200 bls. sulphite.

(Continued on page 66)

Hardy S. Ferguson & Co.

Consulting Engineers

200 Fifth Avenue, New York City

Hardy S. Ferguson..... Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teaze..... Member A.S.M.E., E.I.C.
J. Wallace Tower..... Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants.
Dams and other Hydraulic Structures

H. S. TAYLOR

Consulting Engineer

Member Am. Soc. C. E.—Member Am. Soc. M. E.
Member Eng. Inst., Can.—Member A. I. E. E.

PULP, PAPER, AND FIBRE MILLS
HYDRO - ELECTRIC AND STEAM
POWER PLANTS
PLANS-SPECIFICATIONS-EVALUATIONS
REPORTS - CONSULTATIONS

Jefferson St. Arcade, Dayton, O. **Guarantee Bldg., Montreal, P. Q.**

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

SWC — A NATIONAL ORGANIZATION FOR CONSTRUCTIVE SERVICE

Salesmen's Compensation

A helpful study of this subject will be sent to interested executives. Selling Costs, Sales Quotas, Expense Budgets, Application of Expense to Products, and Basing Pay on Profits are among points discussed.

Scovell, Wellington & Co.

ACCOUNTANTS ENGINEERS
10 East 40th Street, New York City
BOSTON CLEVELAND CHICAGO PHILADELPHIA
SPRINGFIELD SYRACUSE KANSAS CITY SAN FRANCISCO

RAGS—BURLAP—BAGGING—ROPE

JUTE BUTTS, MAGAZINES, CATALOGS, OLD PAPERS, THREAD WASTE AND ALL GRADE OF RAGS CUT QUICKLY AND EFFICIENTLY WITH THE

GIANT The Standard of the World for 59 Years

Giant Rag Cutters have capacities of from 1 to 5 tons per hour

This is the GIANT 3-B CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR

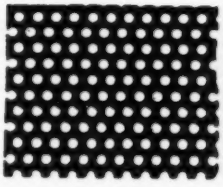
TAYLOR, STILES & COMPANY, Riegelsville, N. J., U. S. A.

CANADIAN REPRESENTATIVES Waterous, Limited, Brantford, Ont., Canada — 133-39 Finsbury Pavement, London, E. C. R. J. MARX SOLE AGENTS FOR EUROPE

Perforated Metal Screens

For Pulp and Paper Mills

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS
63-65 FAIRMONT AVE. JERSEY CITY, N. J.

DAYTON BEATERS

HIGH SPEED

The Dayton Beater & Hoist Co., Dayton, Ohio

Eastern Representative: MANSFIELD, BOLTON & KENT, 501 Fifth Ave., New York, N. Y.
Western Representative: F. H. GODFREY, 415 Lenora St., Seattle, Wash.

JOHN WALDRON CORPORATION

Paper Converting Machinery Builders Since 1827
Main Office and Works—NEW BRUNSWICK, N. J.
CHICAGO NEW YORK

BELLE ALKALI COMPANY, BELLE, W. VA.

LIQUID CHLORIDE BELLE BRAND CAUSTIC SODA

Cylinders—Ton Tanks—Tank Cars
76%—Solid Liquid Flake

Arnold, Hoffman & Co. Inc. Sole Agents
PROVIDENCE BOSTON NEW YORK
PHILADELPHIA CHARLOTTE

Imports of Paper and Paper Stock

(Continued from page 64)

BALTIMORE IMPORTS

WEEK ENDING JUNE 21, 1930

M. W. Bryan, Maryland, Havre, 4 cs. paper.
National City Bank, Maryland, Havre, 1664 bls. rags.
Parsons & Whittemore, Inc., Minnequa, Kotka, 111 rolls news print.
Lagerloef Trading Co., Minnequa, Kotka, 168 bls. wood pulp boards, 24 tons.
Lagerloef Trading Co., Minnequa, Kotka, 1538 bls. sulphite, 259 tons.
——, Minnequa, Kotka, 1185 bls. sulphate, 196 tons.
Pagel, Horton & Co., Inc., Minnequa, Hornefors, 8700 bls. sulphite, 1450 tons.
Congoleum Nairn Co., Anaconda, Antwerp, 2227 bls. rags; 57 bls. bagging.
National City Bank, Waukegan, Havre, 41 bls. rags.
Congoleum Nairn Co., Waukegan, Dunkirk, 454 bls. rags.
W. Steck & Co., Waukegan, Dunkirk, 68 bls. rags.

NORFOLK IMPORTS

WEEK ENDING JUNE 21, 1930

E. Butterworth & Co., Inc., Anaconda, Antwerp, 49 bls. bagging.

NEWPORT NEWS IMPORTS

WEEK ENDING JUNE 21, 1930

British American Tobacco Co., Anaconda, Antwerp, 130 cs. printed cigarette wrappers.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 21, 1930

Phila. National Bank, Maryland, Dunkirk, 284 bls. rags.
Katzenstein & Keene, Inc., Maryland, Dunkirk, 242 bls. rags.
E. Butterworth & Co., Inc., Maryland, Dunkirk, 235 bls. flax waste.
D. I. Murphy, Maryland, Dunkirk, 98 bls. rags.
——, Maryland, Havre, 391 bls. rags.
Katzenstein & Keene, Inc., Exilona, Marseilles, 168 bls. rags.
S. Birkenstein & Son, Exilona, Marseilles, 47 coils old rope.
Fidelity Trust Co., Exmoor, Bari, 125 bls. rags.
Castle & Overton, Inc., Lisbon Maru, Osaka, 21 bls. rags.
J. W. Hampton, Jr., Inc., Exeter City, Bristol, 257 tons china clay.
Castle & Overton, Inc., Bellepline, Antwerp, 120 bls. rags.
——, Bellepline Antwerp, 500 bls. rags.
S. E. Inger, Bellepline, Antwerp, 204 bls. rags.
Phila. National Bank, Bellepline, Antwerp, 141 bls. rags.
E. J. Keller Co., Inc., Bellepline, ——, 57 bls. rags.
Phila. National Bank, C. Gerolimich, Naples, 91 bls. rags.
Banco Com'l. Italiane Trust Co., C. Gerolimich, Naples, 203 bls. rags.
Phila. National Bank, C. Gerolimich, Palermo, 50 bls. rags.

BOSTON IMPORTS

WEEK ENDING JUNE 21, 1930

J. Andersen & Co., Consul Olsson, Stugsund, 675 bls. sulphite, 135 tons.
J. Andersen & Co., Consul Olsson, Hernosand, 300 bls. sulphite, 50 tons.
Perkins, Goodwin & Co., Consul Olsson, Obbola, 4375 bls. sulphate, 625 tons.
R. Bishop Manfg. Co., Pipestone County, Dunkirk, 94 bls. rags.
Katzenstein & Keene, Inc., Pipestone County, Dunkirk, 35 bls. rags.
H. P. Lambert, Pipestone County, Havre, 50 bls. rags.
Hollingsworth Vose Co., Pipestone County, Havre, 60 bls. bagging.
Castle & Overton, Inc., Pipestone County, Havre, 64 bls. rags.
Atterbury Bros. Inc., Pipestone County, Havre, 13 bls. new cuttings.
Irving Trust Co., Pipestone County, Havre, 29 bls. new cuttings.
J. Andersen & Co., Blankaholm, Gothenburg, 1700 bls. sulphite.
Perkins, Goodwin & Co., Blankaholm, Gothenburg, 2587 bls. sulphite; 5715 bls. kraft pulp.
Price & Pierce, Ltd., Blankaholm, Gothenburg, 750 bls. wood pulp.
G. F. Malcolm & Co., Arabic, Liverpool, 4 cs. tissue paper.
E. Butterworth & Co., Inc., Bellepline, Antwerp, 82 bls. flax waste.
——, Bellepline, Antwerp, 20 bls. rags.
Baring Bros. & Co., Bellepline, Antwerp, 99 bls. rags.

Seek Higher Duty on Paper Napkins

An effort is being made to secure a higher rate of duty on paper napkins, by changing the classification from tissue paper to manufactures of paper, wherever the latter rate is higher than the tissue paper rate. The tissue paper rate is 5 cents per pound and 15 per cent or 6 cents and 15 per cent when of light weight, and in many cases the 35 percent rate for manufacturers of paper is productive of a greater protection to domestic mills than the tissue paper rate. The customs officials agree with the contention of the Import Committee of the American Paper Industry and are so classifying the napkins. Importers, however, have protested this ruling to the United States Customs Court. The tariff law provides that in cases where two classifications are correct, that the one producing the higher rate of duty shall be applied.

F. L. Carlisle To Speak at Hudson Falls

HUDSON FALLS, N. Y., June 23, 1930.—It was learned this week that the directors of the local Chamber of Commerce have extended to Floyd L. Carlisle, head of the Niagara-Hudson Power Company, an invitation to come here and address a public gathering. The purpose of the meeting is to have Mr. Carlisle explain to the citizens the possibilities of new industries, the program of the development bureau of the corporation as to its power rights in this village and many other vital details. It is believed that this village is about to become the site of a great power project and in all probability it will become a large industrial center.

New Hydro-Electric Project Announced

OSWEGO, N. Y., June 16, 1930.—A new hydro-electric power project has just been completed on the Salmon River in Oswego County and paper mills and allied industries in this section are expected to derive additional benefits. About one year was required in construction of the big plant and approximately 10,000 units of additional horsepower have been added to the Niagara-Hudson interests. Two hydro-electric generators driven by giant turbines comprise the equipment which generates the operating power from the waters of the Salmon River.

T. C. Bowen Goes With American Writing

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 24, 1930.—Thomas C. Bowen of Great Barrington who has been associated with the Strathmore Paper Company for 25 years and for the past 18 months vice president and manager of the Rising Paper Company of Housatonic recently acquired by Strathmore Paper Company interests, has been secured by the American Writing Paper Company, Inc., to superintend several of its mills, being second in command to Leon M. Yoerg, vice president in charge of production.

Mr. Bowen was born in New York State and graduated from the public schools. He soon developed his worth in the Strathmore mills and received promotion after promotion until he was made general finishing foreman of the four mills and later assistant to the general superintendent and production manager. He is married and has four children. He will remove to Holyoke shortly.

Paper Mill Employment

Employment and payrolls in the paper, pulp and paper box industries decreased in April compared with March according to figures filed with the Bureau of Labor Statistics, Department of Labor.

Two hundred and four paper and pulp mills gave their March employment at 59,791, decreasing in April to 59,377 a decrease of 0.7 per cent. Payrolls in these same mills also decreased from $1,639,964 in March to $1,622,051 in April a decrease of 1.1 per cent.

Reports were received by the Bureau from 182 paper box factories which gave their March employment at 18,723 decreasing in April to 18,463 a decrease of 1.4 per cent. The payrolls in these establishments also decreased from $431,451 in March to $417,806 in April a decrease of 3.2 per cent.

Swedish Paper Mill Strike Settled

The strike in the Swedish mills has been settled and work will be resumed June 30, according to a radiogram received in New York on June 21. Twelve paper mills and four pulp mills were closed by the strike, which began April 22.

WALL BOARD PLANTS

Insulating Board **Hard Board**

Consulting—Contracting—Service

CONTINENTAL

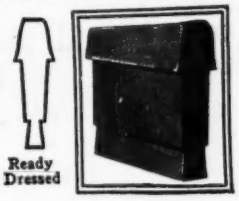
Complete Plants, Design, Supervision, and Reports.

Continental Industrial Engineers Inc.
201 North Wells St. Chicago, Ills.

"READY DRESSED" **MILL COGS**

LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL



WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "C" WHICH IS FREE

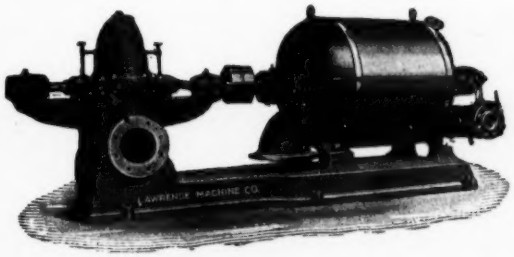
QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., So. Bend, Ind.

Horizontally Split Casing Double Suction Pumps

LAWRENCE PUMPS

The name protects and guarantees you satisfaction.

We are the original designers and builders of the LAWRENCE PUMP.



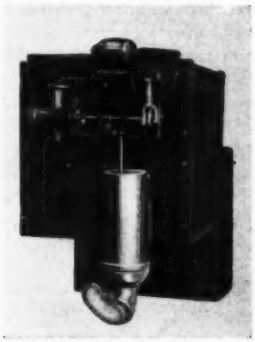
Lawrence pumps for all conditions and services. Forty-four years of practical experience with centrifugal pump development places us among the leaders. Our efforts have been rewarded by the acceptance of our product in general.

Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

Have only Lawrence Pumps, manufactured by the

Lawrence Machine & Pump Company
361 Market St. Lawrence, Mass.

Weight Regulating Stuff Box



UNIFORM BRUSHING ACTION
at the JORDAN
UNIFORM WEIGHT CONTROL
at the PAPER MACHINE
Secured by this new design of
THE TRIMBEY CONSISTENCY REGULATOR

Made By
TRIMBEY MACHINE WORKS
Glens Falls, N. Y.
"Made in Canada" by
FOSTER-WHEELER, Ltd.,
St. Catharines, Ont.

Makers of
Pulp Screens
Metering Systems
Consistency Regulators
Float Valves
Stock Meters

Paper Stock

Supplies for Paper Manufacturers

A reliable source of supply.
Established for 43 years.
Write us your needs

Mendelson Bros. Paper Stock Co.
910 S. Michigan Ave. Chicago, Ill.
Long Distance Phones—
Harrison 2840-41-2842

TAYLOR
SPIRAL RIVETED
PIPE

PAPER MILL PIPING, LIGHT IN WEIGHT, STRONG, DURABLE. MADE FROM RUST RESISTING COPPER ALLOY STEEL, AND FURNISHED HEAVILY GALVANIZED OR ASPHALTED ACCORDING TO SERVICE.
SIZES 3" TO 42" DIAMETER. LENGTHS UP TO 20 FEET GALVANIZED; 40 FEET ASPHALTED.

TAYLOR FORGE & PIPE WORKS, CHICAGO
BOX 485, CHICAGO 50 CHURCH ST., NEW YORK CITY

New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, June 25, 1930.

Conditions in the local paper market during the past week were practically unchanged. Demand for the various standard grades of paper was only moderately active, with the exception of summer specialties, which are in excellent request. Sales forces of the leading paper organizations continue to wage a strenuous campaign and some orders are being booked for future requirements. Prices are holding to schedule, in most instances.

Production of news print is being maintained in sufficient volume to take care of current requirements. Shipments against contract are going forward to the publishers in a satsfactory manner. Inquiries for future needs are fairly numerous. There have been no further developments in the price situation and quotations remain unchanged.

Trading in the paper board market was mostly along routine lines. Box board prices are still easy. The fine paper market continues in a sound position and prices are generally holding to formerly quoted levels. Some improvement was noticed in the coarse paper market and quotations are somewhat steadier.

Mechanical Pulp

Although demand for both domestic and imported ground wood has fallen off, offerings are not excessive and the industry is considered to be in a sound position . The contract movement is normal for the time of year. Prices are generally holding to schedule and there is little talk of concessions around.

Chemical Pulp

No radical changes were recorded in the chemical pulp market. Demand for imported kraft pulp was more persistent, due to the recently announced attractive prices. The Swedish mill strike, in which four pulp mills took part, has been settled and work is to be resumed on June 30, according to word received in New York.

Old Rope and Bagging

Further weaknesses developed in the old rope market and prices were easier. Imported old manila rope is now quoted as from $3.35 to $3.50; while domestic is selling at from $3.50 to $3.75. Small mixed rope is moving in fair volume. The bagging market was rather quiet, although both scrap and gunny remain steady.

Rags

The domestic rag market was fairly active. Demand for cotton cuttings was encouraging, especially for white rags, thirds and blues. Offerings of new cotton rags are limited. Mixed rags and roofing grades are arousing little interest at present. Prices are generally holding to former levels. The imported rag situation shows little improvement.

Waste Paper

Demand for the lower grades of paper stock continues restricted and board mill interest is sadly lackng. Prices of these grades are nominal. The better grades of waste paper, however, continue to display a strong undertone. Offerings of hard white envelope cuttings are limited. Soft white shavings are in excellent request. Book stock is steady. Prices remain unchanged.

Twine

Business in the local twine market was only moderately active during the past week. Demand for the various grades was mostly along routine lines. Inquiries for future needs are fairly numerous. While there have been some reports of shading on extra desirable orders, prices are generally holding to formerly quoted levels.

To Discontinue Use of Word "Nashua"

WASHINGTON, D. C., June 25, 1930.—A distributor of paper box board and box makers' supplies will no longer use in his advertising matter part of a trade name which would imply that his products are made by a competing company, when such is not a fact, according to a stipulation between this individual and the Federal Trade Commission.

While the name of the distributor has been withheld as is the Commission's rule the stipulation entered into is as follows:

Respondent, an individual, engaged in the business of selling paper box board and box-makers' supplies, as a jobber, in interstate commerce, and in competition with other individuals, firms, partnerships and corporations likewise engaged, entered into the following stipulation of facts and agreement to cease and desist forever from the alleged unfair methods of competition as set forth therein.

Respondent, in soliciting the sale of and selling his products in interstate commerce, agreed to cease and desist forever from the use of the word "Nashua" in his advertising matter circulated in interstate commerce, or as a trade brand or designation for his products so as to import or imply that said products are made by the Nashua Gummed and Coated Paper Company, when such is not the fact; and from the use of the word "Nashua," either independently or in connection or conjunction with any other word or words, or in any way in his advertising matter or as a trade brand or designation for his products which may have the capacity and tendency to confuse, mislead and deceive the purchasing public into the belief that said products are the products of said Nashua Gummed and Coated Paper Company, when such is not the fact.

Respondent also agreed that if he should ever resume or indulge in any of the practices in question, this said stipulation as to the facts may be used in evidence against him in the trial of the complaint which the Commission may issue.

Wisconsin Container Corp. Organized

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 23, 1930.—Organization of a new carton concern was announced last week at Menasha, Wis. The corporation will be known as the Wisconsin Container Corporation, with Hugh Strange as president. Mr. Strange is secretary and general manager of the John Strange Paper Company, of Menasha, Wis. It is the plan of the company to take over a plant vacated by the Neenah Shoe Company when that concern was dissolved recently. Several large factory buildings will be utilized and will be equipped immediately with the machinery necessary for heavy carton work. New buildings are contemplated later. The company has been exempted from municipal taxes for five years by the Menasha council.

SKID-EM-ON-TRUCKS
A COMBINED LOADER-CARRIER-UNLOADER THAT WILL SAVE YOU MONEY AND PREVENT ACCIDENTS
435 SOUTH SENATE AVE. INDIANAPOLIS IND.
CENTRAL MACHINE WORKS

FREDERICK L. SMITH
21 EAST 40TH STREET, NEW YORK
PULP AND PAPER MILL ENGINEER

"THE FOURDRINIER THAT TOOK THE IRE OUT OF WIRE"
INTERNATIONAL WIRE WORKS
Menasha, Wisconsin

JAMES W. SEWALL
CONSULTING FORESTRY
JAMES W. SEWALL, Old Town, Maine
PHILLIPS & BENNER, Ruttan Block, Port Arthur, Ontario

Appleton
Felts and Jackets

TRADE "Cel-U-Del" MARK
Patents Pending
The Modern Chemical for Cooking all Classes of Fiber for Paper Manufacture
HARBAUGH PROCESS CO.—CHICAGO, ILL.

Bailey Meter Company
1056 Ivanhoe Road, Cleveland, Ohio
Specializing in
Power Plant Metering Equipment

CHIP SCREENS
CHIP BREAKERS
CHIP SEPARATORS
CONVEYORS
AGITATORS
RYTHER AND PRINGLE COMPANY CARTHAGE N.Y.
CANADIAN INGERSOLL-RAND CO. LTD. 10 Phillips Square, MONTREAL, CANADA
PULP SHREDDERS
SAW SLASHERS
RELIEF GAS COOLERS
LOG HAULS
SPLITTERS

ROSS SYSTEMS
HEATING—VENTILATING—DRYING
J. O. ROSS ENGINEERING CORPORATION
201 North Wells Street, CHICAGO
122 East 42nd St., NEW YORK
311 Lewis Building, PORTLAND, ORE.

KARL A. LEFREN, Inc.
CONSULTING ENGINEERS
171 Madison Ave. New York City

Finished or Semi-finished
STEEL CORES
FOR PAPER ROLLS
The FABRICATED STEEL PRODUCTS CO.
WHEELING, W. VA.

ANALYSES and TESTS of
PAPER, PULP AND PAPER-MAKING MATERIALS
FIBER ANALYSES SPECIFICATIONS
OFFICIAL PULP SAMPLING AND TESTING
Arthur D. Little, Inc.
Analytical Department
30 CHARLES RIVER ROAD, CAMBRIDGE, MASS.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON, WIS.

MID-WEST HI-SPEED BEATERS
MID-WEST LIGHTER STANDS
MID-WEST BANDLESS ROLLS
WRITE FOR INFORMATION
THE MID-WEST MACHINE COMPANY
DAYTON, OHIO

Perforated Metal Screens
for every purpose
also elevator buckets of all kinds; chutes; hoppers; stacks and tanks.
MITCO Products — Interlocked Steel Grating; Shur-Site Stair Treads; Armorgrids.
HENDRICK MANUFACTURING CO.
50 Dundaff St., Carbondale, Pa.
New York: 30 Church St. Pittsburgh: Koppers Bldg.

JOHNSON & WIERK
INCORPORATED
CONSULTING ENGINEERS
For Paper Mills
GRAND CENTRAL TERMINAL BLDG. NEW YORK

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 25, 1930.

BLANC FIXE.—The blanc fixe market is in a sound position. Demand for the pulp and powder is fairly active. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. Shipments against contract are proceeding at a normal pace for the season. Prices remain unaltered. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in drums, at works, according to quantity.

CASEIN.—The casein market was only moderately active. Domestic standard ground is still quoted at 13½ cents and finely ground at 15 cents per pound. Argentine standard ground is selling at 13½ cents and finely ground at 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Conditions in the caustic soda market are practically unchanged. Contract shipments are moving in fair volume. Solid caustic soda is quoted at from $2.90 to $2.95, while the flake and the ground are selling at from $3.30 to $3.35 per 100 pounds, all in bags, car lot quantities.

CHINA CLAY.—The china clay market is exhibiting a steady trend. The contract movement is well up to average. Prices remain unchanged. Imported china clay is quoted at from $15 to $25 per ton, ship side, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—Trading in the chlorine market was light. Shipments against contract are proceeding in a fairly satisfactory manner. Prices declined slightly. Chlorine is now quoted at from $2.40 to $2.45 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market was decidedly weaker. Prices again declined. The grades of gum rosin used in the paper mills are now quoted at from $6.50 to $6.60 per 280 pounds, in barrels, at yards. Wood rosin is selling at from $6.25 to $6.55 per 280 pounds, in barrels, on dock.

SALT CAKE.—Demand for salt cake is fairly persistent and offerings are about sufficient to take care of current requirements. Prices remain unaltered. Salt cake is quoted at from $22 to $25 per ton, while chrome salt cake is selling at from $20 to $21 per ton, in bulk, at works.

SODA ASH.—Most of the business transacted in the soda ash market was along routine lines. Contract shipments are moving in fair volume. Prices remain unchanged. Contract quotations on soda ash, in car lots, at works, are as followe; in bags, $1.32½; and in barrels, $1.55.

STARCH.—Supplies of starch are going forward to the paper mills in a satisfactory manner. Inquiries for future needs are fairly numerous. Prices are unchanged. Special paper making starch is quoted at $3.72 per 100 pounds, in bags, and at $3.99 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is displaying a fairly strong tendency. Demand is active and prices are generally holding to schedule. Commercial grades are still quoted at from $1.40 to $1.55, and iron free at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Consumption of sulphur is being maintained in good volume. Sulphur is quoted at $18 per ton, at mine, on orders of 1,000 tons, or over, on yearly contracts, and at $20 per ton for any smaller quantity over the same period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—The talc market pursues the even tenor of its way. Prices are generally holding to formerly quoted levels, without difficulty. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines, while imported talc is selling at from $18 to $20 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@53.25
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	8.00	@11.00
Book, Cased—		
S. & S. C.	6.00 @	7.50
M. F.	5.75 @	7.00
Coated and Enamel	7.50	@12.00
Lithograph	7.50	@12.00
Tissues—Per Ream—		
White No. 1	.75 @	1.00
Anti-Tarnish	1.35 @	1.90
Colored	1.00 @	2.00
White No. 2	.75 @	.80
Kraft	1.00 @	1.10
Manila	.75 @	.80
Kraft—		
No. 1 Domestic	5.75 @	6.25
No. 2 Domestic	3.75 @	5.00
Southern	3.75 @	4.75
Imported	6.50 @	7.00
Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.75 @	5.25
No. 2 Wood	4.00 @	4.50
Butchers	3.75 @	4.25
Fibre Papers—		
No. 1 Fibre	5.00 @	5.50
No. 2 Fibre	4.75 @	5.25
Common Bogus	2.75 @	3.00
Screenings	3.00 @	3.25
Card Middles	4.00 @	5.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

(Delivered New York)

News, per ton—		
Rolls, contract	62.00 @	—
Rolls, spot	62.00 @	—
Sheets	67.00 @	—
Side Runs	47.00	@52.00
Boards—per ton—		
News	37.50 @	—
Straw	50.00 @	—
Chip	35.00 @	—
Binders' Boards	65.00	@70.00
Wood Pulp	90.00	@95.00
65 Test Jute Liner	37.50	@40.00
85 Test Jute Liner	42.50	@45.00
Sgl. Mla. Ll. Chip.	47.50	@50.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	28.00	@30.00
Dry	30.00	@32.00

(F. o. b. Mill)

No. 1 Domestic	26.00	@30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.00 @	4.25
Easy Bleaching	2.70 @	2.90
No. 1 strong unbleached	2.40 @	2.65
Mitscherlich unbleached	2.50 @	2.85
No. 2 strong unbleached	2.35 @	2.50
No. 1 Kraft	1.75 @	2.15
No. 2 Kraft	1.65 @	1.85
Sulphate—		
Bleached	3.40 @	3.85

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.00 @	4.75
Easy Bleaching Sulphite	2.55 @	2.85
News Sulphite	2.35 @	2.60
Mitscnerfich	3.00 @	3.25
Kraft (Domestic)	2.10 @	3.30
Soda Bleached	2.90 @	3.20

Domestic Rags

New Rags

(Prices to Mill f. o. b N. Y.)

Shirt Cuttings—		
New White, No. 1	9.25 @	9.75
New White, No. 2	7.00 @	7.50
Silesias No. 1	7.50 @	8.00
New Unbleached	10.50	@11.00
New Blue Prints	5.25 @	5.50
New Soft Blacks	5.25 @	5.75
Blue Overall	7.25 @	7.75
Washables	4.75 @	5.25
Fancy	5.50 @	6.00
Mixed Khaki Cuttings	4.75 @	5.25
Pink Corset Cuttings	8.00 @	8.50
O D. Khaki Cuttings	5.15 @	5.75
Men's Corduroy	3.75 @	4.25
New Mixed Blacks	3.50 @	3.75

Old Rags

White, No. 1—		
Repacked	5.50 @	6.00
Miscellaneous	4.50 @	5.00
White, No. 2—		
Repacked	3.00 @	3.50
Miscellaneous	2.50 @	2.75
St. Soiled, White	2.00 @	2.15
Thirds and Blues—		
Repacked	2.25 @	2.50
Miscellaneous	1.75 @	2.00
Black Stockings	3.25 @	3.75
Roofing Rags—		
Cloth Strippings	1.70 @	1.80
No. 1	1.70 @	1.80
No. 2	1.50 @	1.60
No. 3	1.30 @	1.40
No. 4	1.25 @	1.35
No. 5A	.90 @	1.05

Foreign Rags

New Rags

New Dark Cuttings.	2.50 @	3.00
New Mixed Cuttings	2.75 @	3.25
New Light Silesias	7.00 @	7.50
Light Flannelettes	7.50 @	8.00
Unbleached Cuttings	10.00	@11.00
New White Cuttings	10.00	@10.50
New Light Oxfords.	7.00 @	7.50
New Light Prints	5.50 @	6.50

Old Rags

No. 1 White Linens.	7.25 @	8.00
No. 2 White Linens.	5.75 @	6.75
No. 3 White Linens.	4.75 @	5.25
No. 4 White Linens.	3.00 @	3.50
No. 1 White Cotton.	5.50 @	6.50
No. 2 White Cotton.	2.75 @	3.75
No. 3 White Cotton.	3.00 @	4.00
No. 4 White Cotton.	1.95 @	2.15
Extra Light Prints	2.75 @	3.00
Ord. Light Prints	2.25 @	2.50
Med. Light Prints	1.95 @	2.10
Dutch Blue Cottons.	2.15 @	2.30
French Blue Linens	2.65 @	2.75
German Blue Linens	2.30 @	2.50
German Blue Cottons	2.00 @	2.10
Checks and Blues	1.85 @	2.00
Lindsay Garments	1.75 @	1.80
Dark Cottons	1.35 @	1.40
Old Shopperies	1.25 @	1.30
New Shopperies	1.20 @	1.25
French Blues	2.00 @	2.10

Old Rope and Bagging

(Prices to Mill f. o.b. N. Y.)

Gunny No. 1—		
Foreign	1.65 @	1.75
Domestic	1.65 @	1.75
Wool Tares, light	1.60 @	1.65
Wool Tares, Heavy	1.60 @	1.70
Bright Bagging	1.60 @	1.70
Small Mixed Rope	1.25 @	1.40
Manila Rope—		
Foreign	3.35 @	3.50
Domestic	3.50 @	3.75
New Burlap Cut	2.50 @	2.75
Hessian Jute Threads—		
Foreign	3.50 @	4.00
Domestic	3.25 @	3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	3.00 @	3.25
Hard, white, No. 2	2.40 @	2.55
Soft, white, No. 1	2.65 @	2.75
White envelope cuttings	2.90 @	3.10
Flat Stock—		
Stitchless	1.40 @	1.50
Overissue Mag.	1.40 @	1.50
Solid Flat Book	1.30 @	1.40
Crumpled No. 1	1.00 @	1.10
Solid Book Ledger	2.00 @	2.10
Ledger Stock	1.30 @	1.40
New B. B. Chips	.35 @	.45
Manilas—		
New Env. Cut.	2.40 @	2.60
New Cuttings	1.50 @	1.75
Extra No. 1 old	1.25 @	1.35
Print	.60 @	.65
Bogus Wrapper	.60 @	.65
Container	.40 @	.50
Old Kraft Machine—		
Compressed bales	1.50 @	1.60
News—		
No. 1 White News	1.75 @	1.85
Strictly Overissue.	.50 @	.55
Strictly Folded	.40 @	.45
No. 1 Mixed Paper	.20 @	.25
Common Paper	.15 @	.20

You can regrind the seating surface of these
BRONZE GLOBE AND ANGLE VALVES
without removing them

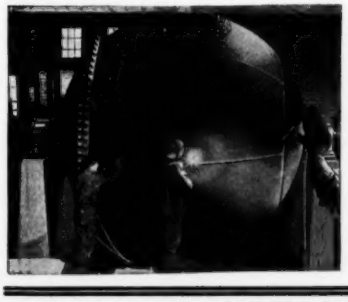
The Eastwood "Perfection" Globe and Angle Valves are practically indestructible. This is because you can remove seating surface, when it shows signs of wear after long service, and regrind. The valve itself stays in the line. *All* parts are renewable, including the disc and seat ring. Maintenance costs are very low.

This valve is of the outside screw type. Can be replaced under pressure with valve wide open. Threads are easily oiled.

EASTWOOD WIRE CORPORATION
Established 1877. Belleville, N. J.
"American Paper Made on American Wires"

EASTWOOD
"Perfection" WIRES
"Perfection" VALVES

KELLOGG
FORGE AND HAMMER LAP WELDED
BOILER DRUMS..HEADERS
RECEIVERS...SEPARATORS
COMPLETE POWER PLANT PIPING
THE M. W. KELLOGG CO.
225 BROADWAY, N. Y. C.
Birmingham Boston Chicago
Los Angeles Pittsburgh Tulsa
ALL KELLOGG FORGE AND HAMMER LAP WELDED PRODUCTS ARE INSURABLE



Biggs Globe, Cylinder and Tumbling Digesters, Welded or Riveted Stationary Digesters
Penstocks
Write for "Unusual Steel Plate Construction"
Biggs Boiler Works Co.
AKRON, OHIO

BIGGS ROTARIES *for years of dependable cooking and bleaching...*

CLAY

AMERICAN MADE FOR AMERICAN TRADE

500 Tons Daily

TWO LEADING AMERICAN CLAYS

H.T. BRAND

FOR COATING & FILLING AND KLONDYKE BRAND FILLER

EDGAR CLAYS ARE THE RESULT OF ALMOST A HALF CENTURY OF EXPERIENCE IN WASHING CLAYS.

TECHNICAL SERVICE AVAILABLE BOTH FOR COATING AND LOADING WITHOUT CHARGE.

Send for Samples

EDGAR BROS. CO.
50 Church St. Hudson Terminal Bdlg.
New York City

Twines
(F. o. b. Mill)

Cotton—			
No. 1	.39	@	.40
No. 2	.37	@	.38
No. 3	.36	@	.37
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrappings, 3-6 Ply—			
No. 1	.19	@	.21
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger	.16	@	.17
Fine Tube Yarn—			
5-ply and larger	.21	@	.25
4-ply	.25	@	.29
3-ply	.28	@	.32
Unfinished India—			
Basis	.13	@	.14
Paper Makers Twine Balls	.11	@	.12
Box Twine, 2-3 ply	.15	@	.17
Jute Rope	.17	@	.19
Amer. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.16	@	.18
No. 2 Basis	.14	@	.16
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Rope	.22	@	.24

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¼	@	.06¼
Sulphite Sreenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07¼
White Tissue—			
20x30 Sheet	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	42.50
Solid News	47.50	@	—
Solid News	40.00	@	45.00
Manila Lined Chip	50.00	@	55.00
Container Lined—			
85 Test	65.00	@	70.00
100 Test	70.00	@	—

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cut-			
No. 1 Soft Shavings	2.10	@	2.15
No. 1 Mixed	.30	@	.35
No. 2 Mixed	.25	@	.35
Ledger & Writings	1.25	@	1.35
Solid Books	1.05	@	1.10
Blanks	1.60	@	1.65
Krafts	1.30	@	1.40
New Kraft Cuts	1.50	@	1.70
Manila Envelope Cuttings	1.65	@	1.70
Ex. No. 1 Manila	1.30	@	1.45
Print Manila	.45	@	.50
Folded News (over-issue	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.30	@	.35
Roofing Stocks—			
(F. o. b. Chicago, net cash)			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.08	@	.40
Writings—			
Superfine	.12½	@	.18
Extra fine	.18	@	.22
Fine	.17	@	.26
Fine, No. 2	.15	@	.25
Fine, No. 3	.09	@	.20
Book, M. F.	.05	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.09	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.04	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¾	@	.06¾
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.03¾
Southern Kraft No. 2	—	@	.03¼
Common Bogus	.03½	@	.04
(Delivered Philadelphia)			
News Print Rolls	62.00	@	—
Straw Board	52.50	@	70.00
News Board	37.50	@	38.50
Chip Board	32.50	@	35.00
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00		
No. 2, per ton	70.00		
Carload lots	68.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.10½	@	.11
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07	@	.09
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable, No. 1	.04½	@	.05
Blue Overall	.07½	@	.08
Cottons—According to grades—			
Washable, No. 2	.03	@	—
New Blue	.03	@	.03½
Fancy	.05½	@	.06
New Black Soft	.05	@	.05¾
New Light Seconds	.02½	@	.03
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05½	@	.05¾
No. 2 Mixed	.04½	@	.04¾
Corduroy	.03	@	.03½
New Canvas	.08½	@	.09
New Black Mixed	.03¾	@	.04½

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	3.50	@	4.00
Sisal Rope	1.50	@	—
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.65	@	2.75
No. 2 Hard White	2.30	@	2.50
No. 1 Soft White	2.25	@	2.50
No. 2 Soft White	1.40	@	1.60
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.60	@	.70
Solid Ledger Stock	1.55	@	1.65
Writing Paper	1.05	@	1.25
No. 1 Books, heavy	1.00	@	1.20
No. 2 Books, light	.90	@	1.00
No. 1 New Manila	2.15	@	2.30
No. 1 Old Manila	1.50	@	1.60
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.35	@	1.40
Common Paper	.25	@	.35
No. 1 Mixed Paper	.25	@	.30
Straw Board, Chip	.35	@	.40
Binders Board, Chip	.35	@	.45
Overissue News	.45	@	.50
Old Newspaper	.25	@	.30

Domestic Rags (Old)

White No. 1—			
Repacked	4.25	@	4.50
Miscellaneous	3.50	@	3.75
M. G.	6.00	@	—
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.60	@	1.80
Black Stockings (Export)	3.90	@	4.25
Roofing Stock—			
Foreign No. 1	1.25	@	1.30
Repacked	.80	@	.90
No. 2	.70	@	.75
No. 3 (Roofing)	.30	@	.40
No. 4	.30	@	.40
No. 5A	.70	@	.75
B	.40	@	.60
C	.25	@	.30

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag content	.15	@	.30
All rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.06
No. 2 Kraft	.03¾	@	.05
(Less car-freight to Boston)			
Southern Kraft	.03¾	@	.04¼
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
Delivered New England points			
News Print Rolls	61.50	@	—
Straw Boards, rolls	.009		52.50
Straw Board in Sheets, basis 35s to 70s	54.50	@	55.00
Filled News Board	37.50	@	40.00
Chip Board	35.00	@	37.50
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated Newsboard Bender	65.00	@	80.00
Wood Pulp Board	75.00	@	80.00
Binder Boards	70.00	@	75.00
(F. o. b. Mill)			
Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.50	@	2.60
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	—	@	2.25
No. 1 Books, Heavy	1.30	@	—
No. 1 Books, Light	1.05	@	—
Manila Env. Cuttings	2.00	@	2.25
No. 1 Old Manila	.90	@	1.00
White Blank News	1.50	@	1.60
Old Kraft	1.40	@	1.50
Print Manila	.75	@	.80
No. 1 Mixed Paper	.20	@	—
Overissue News	.40	@	.50
Old Newspapers	.35	@	.40
Box Board, Chip	.45	@	.50
Corrugated Boxes	—	@	.40

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.75
Domestic	1.45	@	—
Manila Rope—			
Foreign	3.00	@	3.25
Domestic	3.50	@	—
Transmission Rope	2.25	@	2.40
Mixed Strings	.90	@	—
Jute Wool Strings	.90	@	1.00
Jute Carpet Threads	1.05	@	1.15
Scrap Burlaps	1.25	@	1.40
Scrap Sisal	1.50	@	1.75
Scrap Sisal for shredding	1.75	@	2.00
Wool Tares, heavy	1.60	@	—
New Burlap Cutting	1.75	@	2.00
Australian Wool Pouches	2.50	@	3.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.08	@	.08½
Silesias No. 1	.06	@	.06¼
New Unbleached	—	@	.09¼
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.05	@	—
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.75	@	3.00
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.75	@	1.90
Black Stockings	—	@	4.00
Roofing Stock—			
No. 1	1.25	@	1.50
No. 2	.90	@	1.00
No. 3	.85	@	.90
No. 4	.75	@	.85

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.90	@	1.00
New No. 1 Shirt Cuttings	8.50	@	9.00
Dutch Blues	2.00	@	2.12½
Lace Curtains	4.50	@	4.75
New Checks & Blues	4.25	@	4.60
Old Fustians	1.90	@	2.00
Old Linsey Garments	1.25	@	—

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¾	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.50	@	—
No. 2 M. F. (carloads)	7.25	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.00	@	—
No. 2 S. C. (carloads)	7.75	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
White, No. 2	2.00	@	2.25

(Delivered Toronto)

News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	60.00	@	—
Sulphite news grade	60.00	@	—
Sulphite, bleached	72.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.00	@	—
Soft White Book Shavings	2.85	@	—
White Blk. News	1.60	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.40	@	—
Light and Crumpled Book Stock	1.25	@	—
Ledgers and Writ-			
Solid Ledgers	1.50	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.85	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09¾	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

East Engin. Lib.

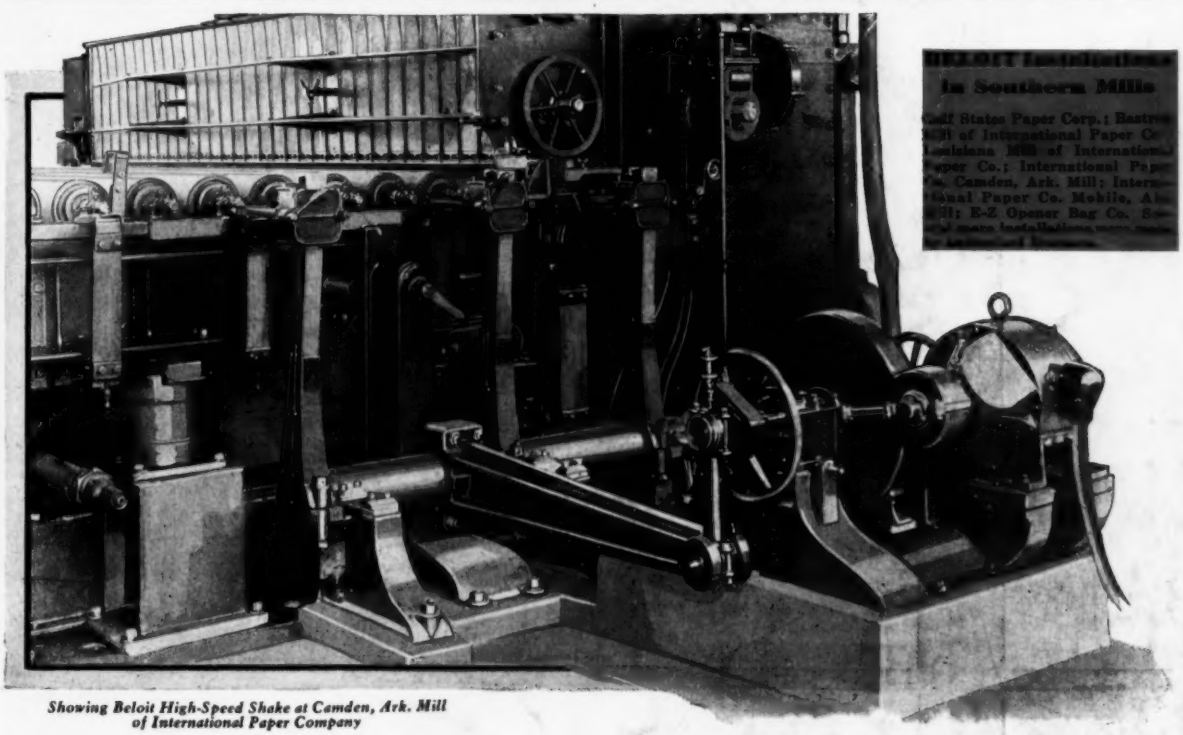
PAPER TRADE JOURNAL

REG. U. S. PAT. OFF.

10 EAST 39TH ST., NEW YORK

Vol. XC JUNE 26, 1930 No. 26

THE SOUTH GOES BELOIT



BELOIT Installations in Southern Mills

Gulf States Paper Corp.; Bastrop [illegible] of International Paper Co. Louisiana Mill of International Paper Co.; International Paper Co. Camden, Ark. Mill; International Paper Co. Mobile, Ala. Mill; E-Z Opener Bag Co. Several more installations were made [illegible]

Showing Beloit High-Speed Shake at Camden, Ark. Mill of International Paper Company

BEFORE the International Paper Company began its extensive Southern program, it was discovered that in the making of kraft from Southern pine, Beloit machines had made unusual and enviable production records.

Today, every major installation in the South includes a *Beloit Removable Fourdrinier and Highspeed Shake.* There must be a reason. Write for the facts. The *Beloit* Way is the *Modern* Way.

BELOIT IRON WORKS. The BELOIT BELOIT, WIS., U. S. A.

HOOKER CHEMICALS

..of the Highest Quality...

HOOKER ELECTROCHEMICAL CO

Every product, every process has originated in or passed thru our Research Department. We are justly proud of this painstaking care in development and production. It guarantees you Hooker Chemicals of the Highest Quality.

With plants conveniently located and our policy of carrying ample stocks of materials on hand at all times, we are prepared to make prompt and efficient deliveries to all sections of the country.

HOOKER CHEMICALS

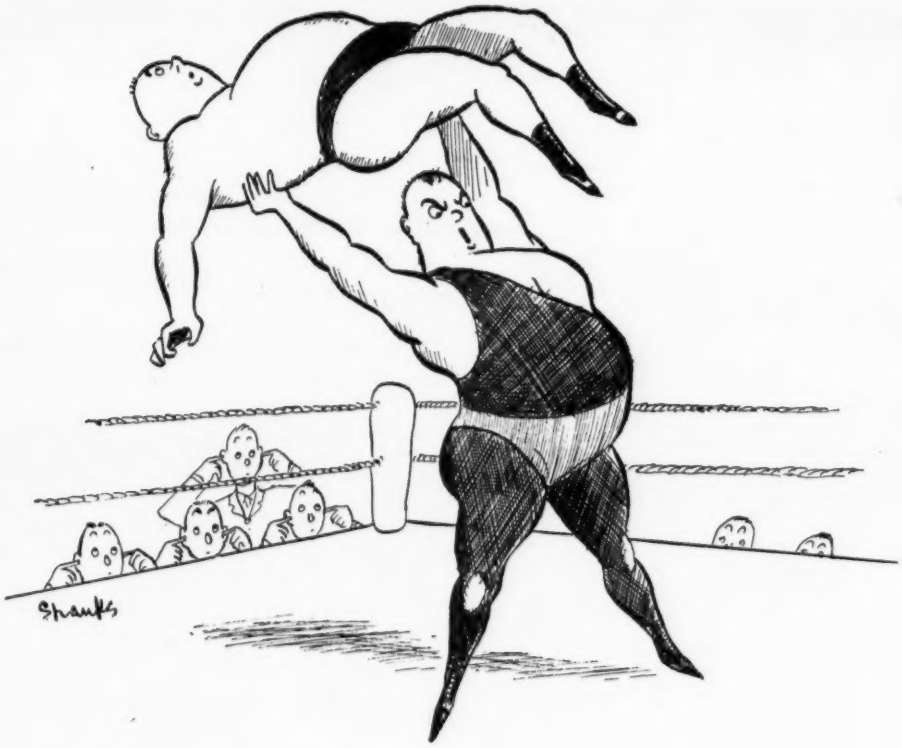
Caustic Soda
Liquid Chlorine
Bleaching Powder
Muriatic Acid
Monochlorbenzene
Paradichlorbenzene
Benzoate of Soda
Benzoic Acid
Benzoyl Chloride
Benzyl Alcohol
Antimony Trichloride
Ferric Chloride
Sulphur Monochloride
Sulphur Dichloride
Sulphuryl Chloride
Salt

HOOKER ELECTROCHEMICAL CO.

EASTERN
Plant—Niagara Falls, N. Y.
Sales Office—60 East 42 St., New York City

WESTERN
Plant—Tacoma, Washington
Sales Office—Tacoma, Washington

Entered as second class matter August 12, 1925, at the Post Office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. ESTABLISHED 1872 FIFTY-EIGHTH YEAR Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., E. Stroudsburg, Pa. EXECUTIVE AND EDITORIAL OFFICES: 10 East 39th Street. NEW YORK CITY CHICAGO: 123 West Madison Street, Chicago, Ill.



Making the Most of Power

INCOMPARABLE endurance... making the most of power... these qualities account for the popularity and the prestige of Graton & Knight Leather Belting.

A large manufacturer of coated papers and cardboards in Pennsylvania bought a Graton & Knight Leather Belt for a calender machine. He soon learned that his operating costs were lower and therefore replaced the belt on the main drive with a Graton & Knight Leather Belt.

Many paper mills are using more and more of this better running, longer lasting leather belting. Their records of operation show that Graton & Knight Leather Belting makes the most of its power transmission qualities.

Write for the Belting Manual. It is full of practical helps for users of Leather Belting.

Graton & Knight Company
Worcester, Mass.

GRATON AND KNIGHT

OTHER INDUSTRIAL PRODUCTS

Rubber Transmission, Conveyor and Elevator Belting

Mechanical Rubber Goods

Lace Leather

Belt Cements and Dressings

Get YOUR Free Copy!

Address Department E-30

Send for your free copy of the Belting Manual, the most complete book of its kind. One hundred and ninety-six pages of practical belting and transmission information.

Graton & Knight

Standardized

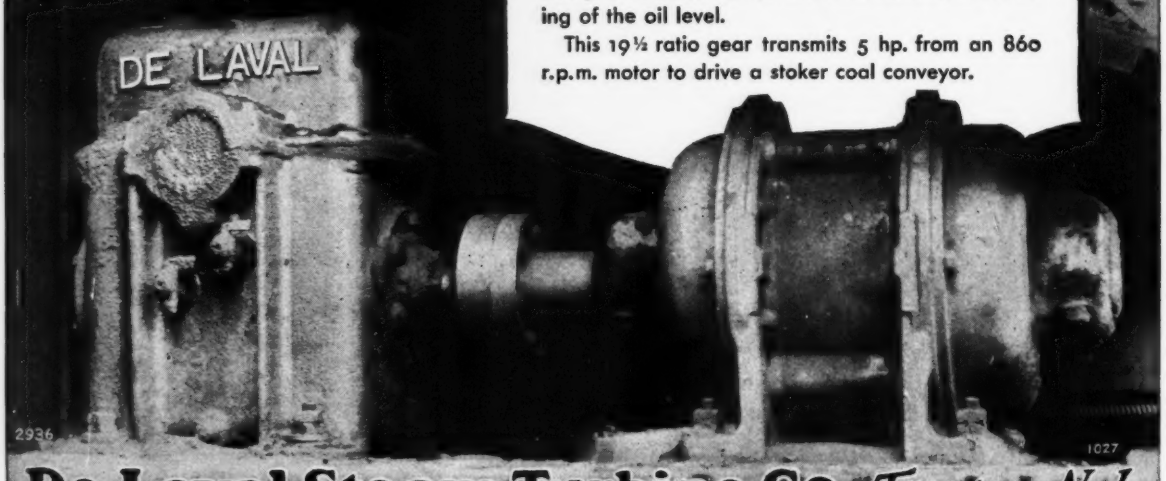
LEATHER BELTING LASTS LONGER

De Laval Worm Gear

DEFIES DIRT and NEGLECT

BEING entirely self-enclosed and self-lubricated, it requires no attention further than occasional checking of the oil level.

This 19½ ratio gear transmits 5 hp. from an 860 r.p.m. motor to drive a stoker coal conveyor.



De Laval Steam Turbine Co., *Trenton, N.J.*

CAMACHINE ROLL-WINDERS

for FINISHING ROOM SERVICE

There is plenty to be said in favor of installing a Cameron Winder at the end of your paper machine but there are also many opportunities for profit with a Cameron Roll-Winder in the finishing room.

We are pleased to offer the following machines for efficient roll-winding service in the finishing room.

CAMACHINE 14 Paper or Board Mill Winder and Rewinder. Maximum winding speed 1400 F.P.M. For standard and specialty rolls of all kinds of paper and board; widths from 62″ to 92″.

CAMACHINE 12 Paper or Board Mill Winder and Rewinder. Maximum winding speed 1000 F.P.M. for standard and specialty rolls of all kinds of paper and board; widths 52″ to 92″.

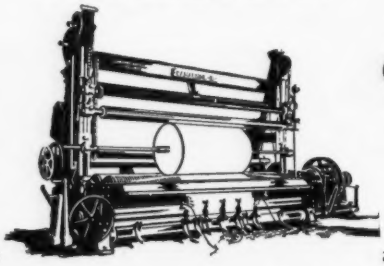
CAMACHINE 10 Model 10 Finishing Room Rewinder for Paper and Board. Maximum winding speed 800 F.P.M. For small and medium large rolls of all kinds of paper and board; any diameter up to 36″; widths 42″, 52″, 62″, 72″, 82″.

CAMACHINE 9 Model 5 Rewinder for Paper Specialty Rolls. Maximum winding speed 600 F.P.M. For extra narrow and medium small specialty rolls in paper mills, converting plants and paper goods factories; any diameter up to 24″; widths 32″, 42″, 52″, 62″.

CAMACHINE 6 Rewinder for Paper Specialty Rolls. Maximum winding speed 450 F.P.M. For midget rolls, extra small and medium size rolls of all kinds of paper; any diameter up to 24″; widths 32″, 42″, 52″, 62″.

Send for interesting literature

CAMERON MACHINE COMPANY



61 POPLAR ST. BROOKLYN, N. Y.

THEY MUST TEST
TO A SINGLE STANDARD...
the standard of WALWORTH QUALITY

• The line of Walworth valves today is fundamentally a quality line. • All of our products are subject to certain standard Walworth tests which assure satisfactory service. • In making valves, however, we go a step farther and test every one of them individually before shipment. • This means that when you put a Walworth valve on any line in your plant it will take up its share of responsibility as unfailingly as though you had picked it out and tested it yourself.

Specify
WALWORTH
VALVES
FITTINGS
AND TOOLS

for Severe Service

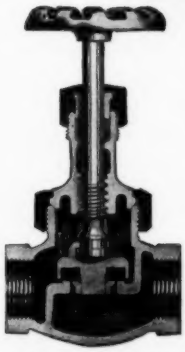


FIG. 227 GLOBE VALVE

• WALWORTH RE-NEW DISC VALVE • Although designed for lighter pressures than the higher rated Walworth Bronze Valves, the Re-New-Disc is a glutton for punishment. • It is solidly, ruggedly built and its renewable disc gives the valve a new lease of life time and again through years of unfaltering service. • It is recommended for steam working pressures up to 150 pounds.

FIG. 227A ANGLE VALVE

WALWORTH

Walworth Company, General Sales Offices: 60 East 42nd St., New York
Plants at Boston, Mass.; Kewanee, Ill.; Greensburg, Pa.; and Attalla, Ala.
Walworth Company Limited, 660 St. Catherine Street West, Montreal, P. Q.
Walworth International Co., 11 Broadway, New York, Foreign Representative
... *Distributors in Principal Cities of the World* ...

SOLVAY PRODUCTS

Soda Ash

Caustic Soda

Liquid Chlorine

Contract or Spot Delivery
In tank cars and multiple unit cars.

Write for Prices

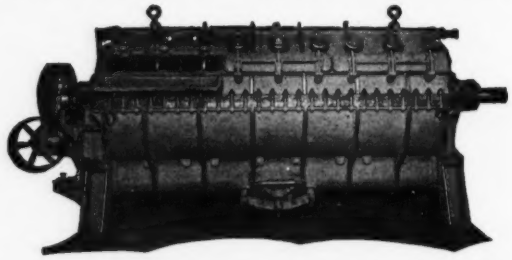
SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 Rector Street New York

Boston Syracuse Chicago Indianapolis Cleveland
Cincinnati Pittsburgh Detroit Philadelphia
Kansas City St. Louis Atlanta

PULP RECOVERY

from black liquors at least 3½ pounds per thousand gallons, by the use of

VALLEZ
ROTATING LEAF FILTERS



Evaporator capacity is increased. Maintenance and labor costs are kept down. Green liquors are cleared of ash and other impurities. Lime is removed and reclaimed from the white liquor.

Vallez Filters give 100% efficiency in the removal of solids on a single filtration. Rotation of the filter leaves makes possible utilization of entire filtering surface to maximum capacity. Sluicing off is accomplished thoroughly within the filter. It is never necessary to remove the leaves for washing, or to open the filter during operation.

J. & G. HEAVY DUTY ROTARY VACUUM FILTERS

Continuous in operation and require a minimum of supervision. Self-discharging; self-cleaning; work automatically. Have high capacity on lime sludges and white waters. Also used as washers and thickeners.

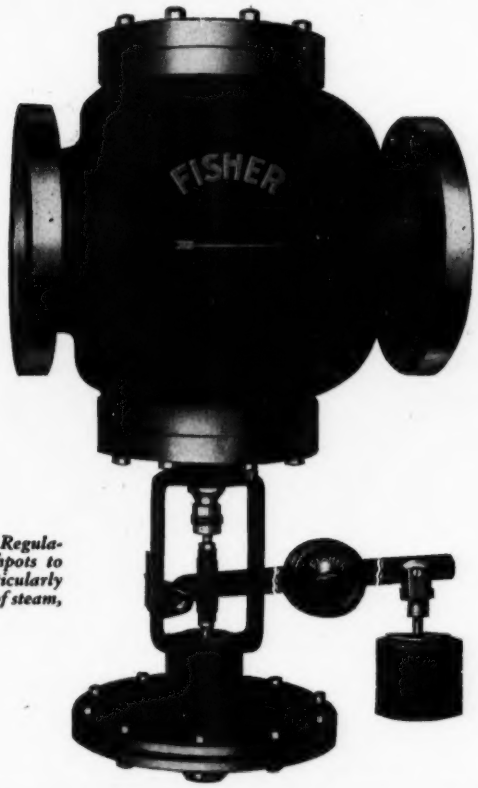
J. & G. Quadruple Effect EVAPORATORS and CONCENTRATORS

Especially designed to give high capacity and concentration on black liquors.

Our engineering department will gladly submit recommendations, complete equipment data and estimates to meet your specific problems. Write for catalog.

GOSLIN-BIRMINGHAM MFG. CO.

Main Office and Works: **Birmingham, Ala.**
New York Office: **82 Beaver Street.**
Cable Address: "JOUGOS"—Western Union Code—5 letter



The Fisher 10-A Pressure Regulator — no pistons, no dashpots to scale or corrode — particularly adapted for low pressures of steam, oil, or any fluid.

Name Your Pressure Problem Fisher will name the answer

Name your pressure regulating problem, common or unusual. Fisher will name the correct answer.

The Fisher Pressure Regulator Line embraces over 700 designs, types and sizes for steam; oil and related plants alone—with special Fisher metals to lick heat and corrosion.

And each Fisher Regulator meets the same manufacturing steps it would if developed exclusively for you in our laboratory.

Valves are ground in by hand under the temperatures and pressures you specify.

And each succeeding test is made on the basis of what will happen to the regulator in your plant.

So Fisher is not only able to name the correct answer—but can assure that answer for every day, year in year out, service.

These simple facts explain why Fisher Regulars are conceded to outsell every other make.

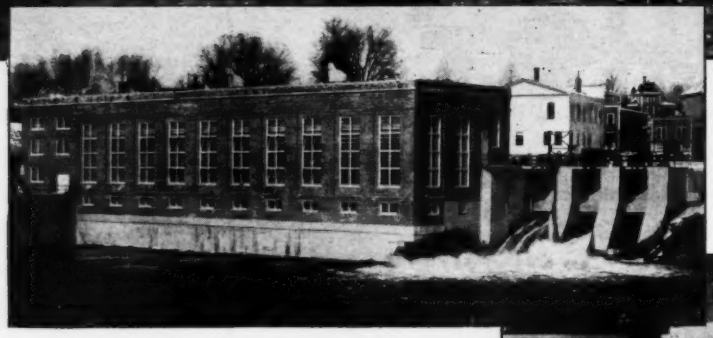
The Fisher Catalog detailing construction, application and design of Fisher Pressure Regulators—and the many other Fisher Specialties — becomes a handbook on fluid control. Copies sent when requested on business stationery.

Steam Pump Governors
[10 to 10,000 lbs.]
Boiler Feed Pumps
Fuel Oil Pumps
Vacuum Pumps
Receiver Tank Pumps
Pump By-Pass Valves
electric and power driven pumps
Reducing Valves, Pressure Regulators
for all pressures—liquids, gases, steam
Differential Pressure Regulators
Vacuum Regulators
Strainers
pipe, suction and drip pocket
Liquid Level Controllers
direct and remote type
Lever Valves
air, gas, or liquid
Float Valves
Fluid Mixers
Hydraulically Operated Valves
Relief Valves
Back Pressure Valves
Steam Traps—Air Traps—
Gasoline Traps—Grease Traps
Exhaust Heads
Steam and Oil Separators
Drip Pockets
Vapor Pressure Controllers
for oil storage tanks
Boiler Gas Fuel Governors
Gas Engine Fuel Regulators
Automatic Gas Relief Valves
Gas Pressure Regulators
main and house service
Liquefied Petroleum Gas Regulators
for gas cylinders
Gas Water Traps

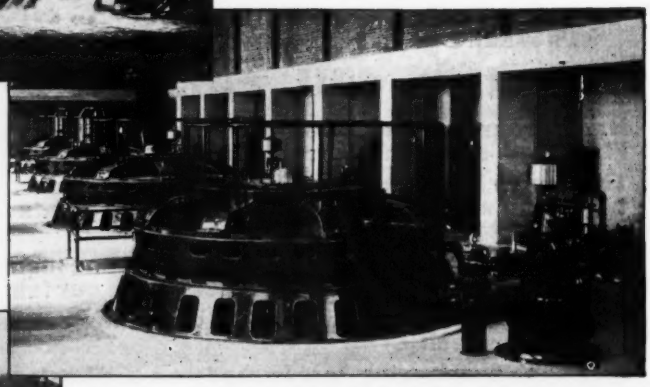
FISHER

THE FISHER GOVERNOR COMPANY, Inc.
2200 Fisher Bldg.
Marshalltown, Iowa

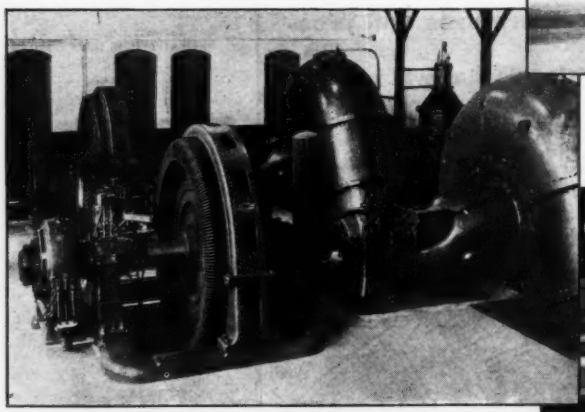
(*Above*) Panoramic view of Great Northern Paper Company mill at Millinocket, Maine



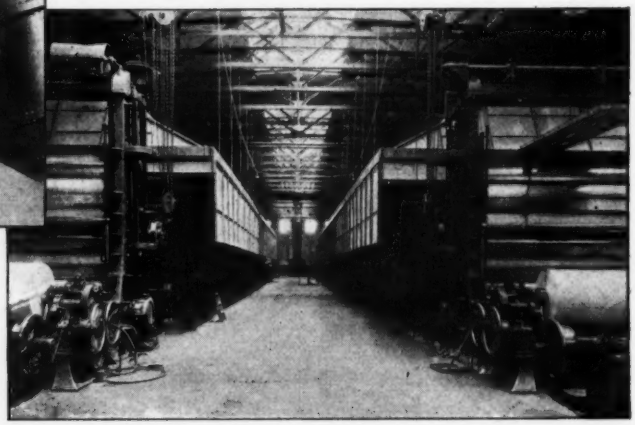
(*Above*) Madison Power Plant—one of the Great Northern Paper Company's Hydro-Electric plants



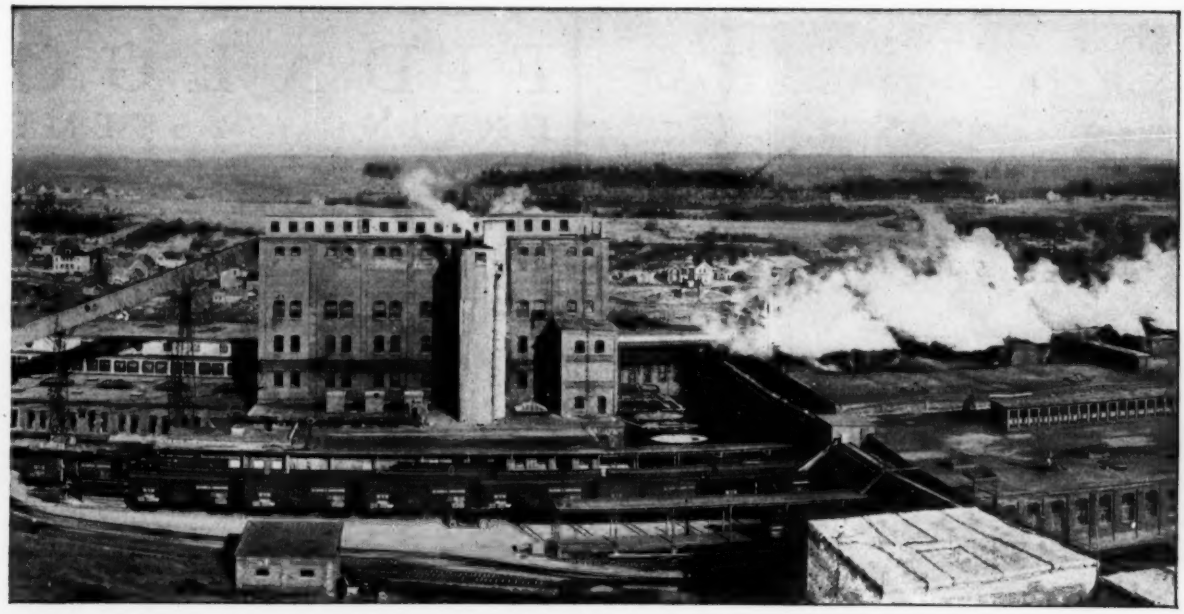
(*Above*) Madison Turbo-Generator units



(*Above*) Millinocket Hydro-Electric plant



(*Right*) Two of the huge newsprint machines, lubricated with Gargoyle lubricants



Correct Lubrication

at the mills of the Great Northern Paper Company

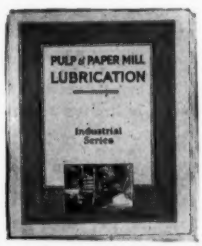
From an initial production of 350 tons of newsprint per day to an actual production of 1050 tons per day—that is the record of the Great Northern Paper Company, one of the largest manufacturers of newsprint in the country.

The consistent use of Gargoyle Lubricating Oils and Vacuum Engineering Service for their most exacting lubricating requirements has been a major factor in setting up this unusual record. Vacuum lubrication engineers and plant engineers have cooperated to bring about mechanical improvements and more efficient operation. Savings in power alone, in the various paper-making machines, ran as high as 30%.

The best lubricants and the best engineering counsel are a tremendous asset in paper-making—where bearings are so numerous and production breakdowns are so costly. That is why 36 of the 50 most important paper manufacturers in the United States use Vacuum Oil Company lubricants and service.

You will never know whether you are getting maximum production at minimum cost per ton, until you have used Gargoyle lubricants and Vacuum Oil Company service.

Further information can be had from any Vacuum Oil Company representative—ask for it.



Many paper mill operators have found this book particularly helpful in the lubrication of their equipment. We will be glad to send it, without obligation, to any member of your organization, upon request.

GARGOYLE OIL

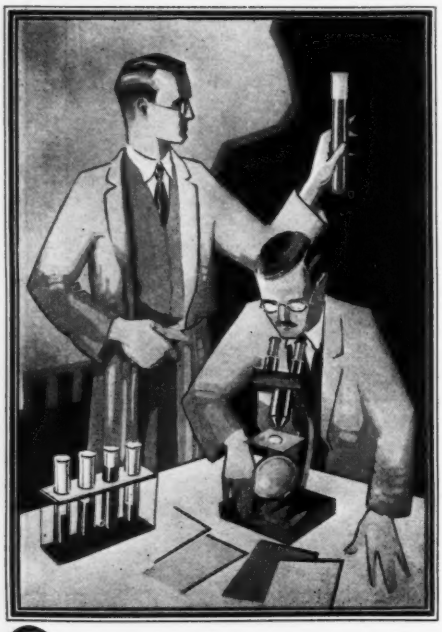
Lubricating Oils

The World's Quality Oils for Plant Lubrication

Vacuum Oil Company

Headquarters: 61 BROADWAY, NEW YORK

Branches and distributing warehouses throughout the world



The Search for Better Broader Service

OUR era of tremendous advance in transportation has brought, also, the need for the right paper for scientific protection in packaging. This is the problem to which the science and skill of the KVP Laboratories is wholeheartedly devoted.

These experts are unceasing in their efforts; constantly the search goes on, bettering the service and broadening its scope.

KVP PAPER

Proper packaging is still an imperfect science; the field is wide, the needs growing with the widening markets. And KVP service in most cases, anticipates the growing needs.

Here is, also, constant search toward more economical methods of production -- short cuts that save time and labor without lessening quality -- striving to make KVP Papers of highest possible quality at lowest possible cost.

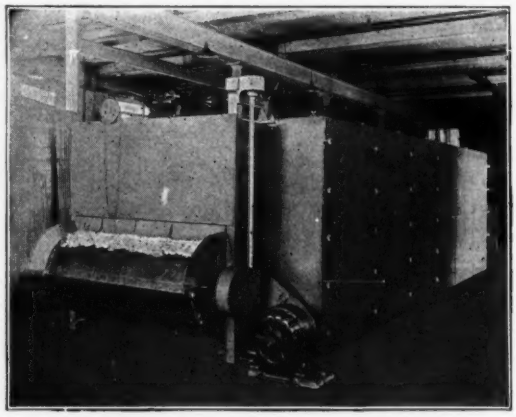
How well this goal has been achieved is proved by the growing list of users who represent leadership in their various industries.

KALAMAZOO VEGETABLE PARCHMENT CO.
Kalamazoo, Michigan, U. S. A.
MANUFACTURING WORLD-FAMOUS FOOD-PROTECTION PAPERS

FIDALGO
DRYING SYSTEMS
(PATENTS GRANTED AND PENDING IN ALL COUNTRIES)

DRYING FIDALGO SYSTEMS

Specially Designed for Drying
Bleached or Unbleached Sulphite, Soda, Sulphate and Ground Wood



THE Fidalgo method of drying pulp will not in any way affect the quality or test of the pulp; its strength factor is practically the same as wet pulp, and its beating time is considerably less.

Dryer is insulated and enclosed assuring clean product.

Can be operated with live or exhaust steam . . . small investment.

We invite you to investigate any of our installations. Write for bulletin and full particulars.

FIDALGO PRODUCTS

FIDALGO DRYER—for shredded pulp
DRYAD—Continuous dryer for board
PEHRSON ROTARY DRYER—for chips and bark
FIDALGO SHREDDER—for all kinds of pulp
MEYERS-MESCO STOCK CONSISTENCY REGULATOR—for all kinds of stock
BEADLE METERING DEVICE—for metering any number of stocks
NEWNAP FELT CONDITIONER—for conditioning press felts
PROMI MICROSCOPE—for fibre study in laboratory
WET MACHINES
BALING PRESSES
FILTERS AND THICKENERS
FLAT SCREENS

FIDALGO DRYING SYSTEMS
INCORPORATED
122 EAST 42nd STREET NEW YORK, N. Y.

WHAT DO WE MEAN by "CONTROL"?

There is no device, process or precaution known to science which we do not employ in our laboratories to insure perfection in our dyes.

To mention but a single instance—we maintain "control laboratories" in each of the different departments through which a batch of dyes must pass. Here, results are checked and rechecked over and over again—and comparisons made with a "control sample" which represents the exact result to be obtained.

Rigid control of production means rigid adherence to a standard of quality which brooks no compromise. That is why National Dyes maintain the same high quality today, tomorrow and always.

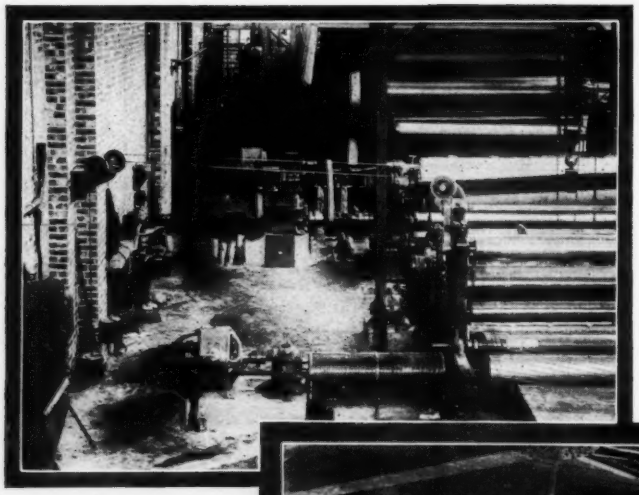
NATIONAL DYES

NATIONAL ANILINE & CHEMICAL CO., INC.

40 Rector Street, New York, N. Y.

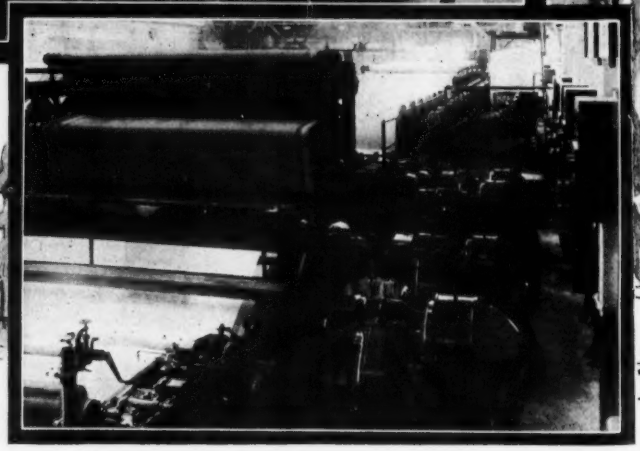
CHICAGO • CHARLOTTE • BOSTON • PHILADELPHIA
SAN FRANCISCO • PROVIDENCE • ORONTO

ONE



202-inch Fourdrinier bond machine at Grays Harbor Pulp & Paper Co., Hoquiam, Wash., equipped with Westinghouse Sectional Paper Machine Drive. (below)

Dry end of 132-inch tissue and crepe machine at National Paper Products Co., Carthage, N. Y., equipped with Westinghouse Sectional Paper Machine Drive. (above)



Wet end of 152-inch Fourdrinier machine producing book paper at New York & Pennsylvania Co., Lock Haven, Pa., equipped with Westinghouse Sectional Paper Machine Drive.

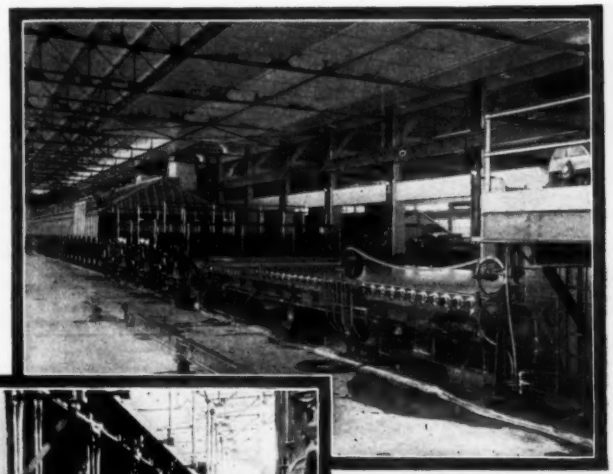
DRIVE FOR ALL

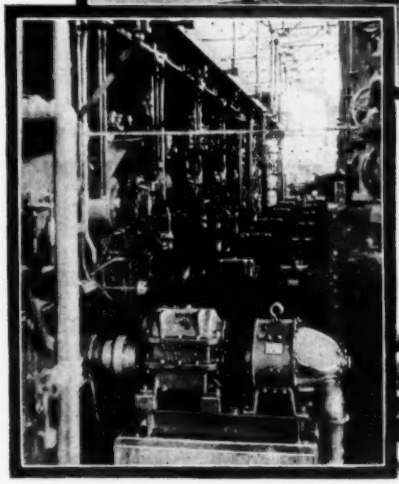
TISSUE, crepe, news, board, kraft, book or bond—in any width or speed range, at any speed—all are made on paper machines equipped with Westinghouse sectional paper machine drive. Fourdrinier or cylinder, no matter of what type, all are adaptable to the wide application of this modern drive.

In the development and modernization of the paper machine drive, Westinghouse has initiated the major improvements in this power application. Following successful performance, these improvements have become the standards for paper machine drive specifications.

With a well merited reputation for sound and advanced engineering, gained through years of experience and close cooperation with the industry, Westinghouse paper mill engineers can render a service in the application of sectional drive that will assure the most successful results in paper machine operation.

234-inch high-speed news machine at Washington Pulp & Paper Co., Port Angeles, Wash., equipped with Westinghouse Sectional Paper Machine Drive.





Left—Cylinder mould drives on 130-inch board machines at National Paper Products Co., division of Crown Zellerbach Corp., Port Townsend, Wash. Westinghouse equipped.

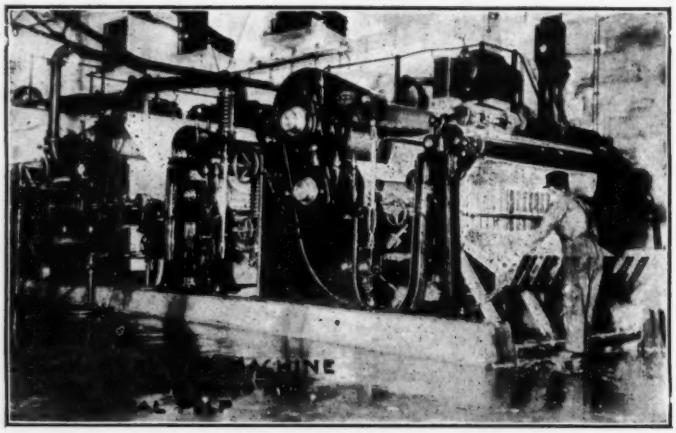
Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

T 31382

TUNE IN THE WESTINGHOUSE SALUTE OVER THE N. B. C. NATION-WIDE NETWORK EVERY TUESDAY EVENING.

100 Tons Kraft Per Day – 58 % A. D.



With the Famous

Kamyr Wet Machine

Production . . . .

Kraft	up to 100 Tons
Sulphite	up to 80 Tons
Soda	up to 60 Tons
Groundwood	up to 50 Tons

Results . . . . . .

With 1 Press	42% A.D.
With 2 Presses	55% A.D.
With 2 Presses & Predryer	58% A.D.

Saves . . . . . .

Felt, wires, Labor, Upkeep, Power, Fibre, Floor Space

G. D. Jenssen Co.

200 5th Ave.
N. Y. C.

1017 White Bldg.
SEATTLE

Sole Agents in U. S. A.
for
PAPER MACHINERY Ltd.
MONTREAL

Established 1819

CHARLES LENNIG & CO., Inc.

Aluminum Sulfate

Commercial and Iron Free

Specially made for the Paper Industry

Office:
222 West Washington Square, Phila., Pa.

Works:
Bridesburg, Philadelphia, Pa.

PUMPING BLACK LIQUOR FOR PAPER MILLS

The new Byron Jackson fractionator type of Black Liquor Pump is meeting a distinct need in the pulp industry. It is featured by super-construction throughout. Extra heavy shaft in coffin type bearing housing insures against any shaft vibration whatsoever, and provides a perfectly tight stuffing box.

Adjustable endwise position of the pump shaft is of great value in offsetting wear in the open impeller construction and may be used as required. This fractionator type of construction, permitting inspection or removal of pump impeller without disturbing suction or discharge piping, is of great advantage in a pulp mill.

SINCE 1872

BYRON JACKSON CO.

Factories: BERKELEY, Los Angeles, Visalia, Calif.
Branches: NEW YORK and CHICAGO
Houston, Tulsa, Dallas, Detroit, San Francisco, Portland, Salt Lake, Phoenix

BYRON JACKSON
CENTRIFUGAL PUMPS FOR EVERY SERVICE

No CALENDER *can be better than the* ROLLS *in it*

CALENDER ROLLS

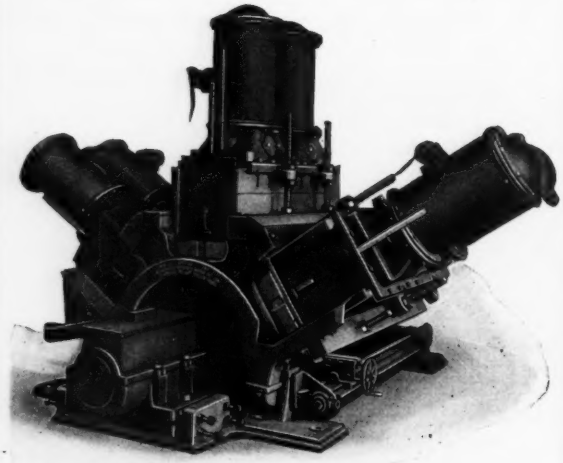
Cotton Rolls
Paper Rolls
Embossing Rolls
Chilled Iron Rolls

The high finishing qualities of Perkins Calender Rolls are the natural result of the longest and broadest experience in the manufacture of this highly specialized product.

B. F. PERKINS & SONS, Inc.

HOLYOKE, MASS.

COTTON ROLLS
PAPER ROLLS
EMBOSSING ROLLS
CHILLED IRON ROLLS
GRANITE PRESS ROLLS
WEB
SUPERCALENDERS
GLASSINE
SUPERCALENDERS
FRICTION
CALENDERS
EMBOSSING CALENDERS
SHEET CALENDERS
PLATERS
MULLEN PAPER TESTERS
TENSILE TESTERS
VENTILATING FANS
RAG CUTTERS
STOCK CUTTERS
PAPER DAMPENERS
BLEACH EJECTORS



International Grinders

Curtis Patent for 4-ft. Wood

Possess all the advantages of Pocket Grinders for 2-ft. wood—low capital cost, low-building cost, low maintenance and stone cost—plus the great convenience and economy of using 4-ft. wood.

Built in two stone sizes, 60″ x 54″ and 54″ x 54″.

Curtis Hydraulic Stone Truing Lathe furnished as standard equipment.

Full particulars on request.

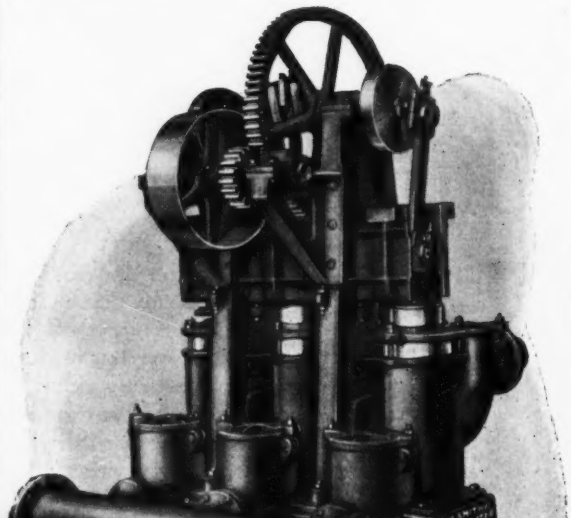
Montague Machine Co.

TURNERS FALLS, MASS.

STUFF PUMPS

OUR "TRIPLEX" STUFF PUMP

is on a par with all other Pulp and Paper Mill Equipment we manufacture. The fact of its satisfactory use in leading mills attests its efficiency.



Built for service, it handles stock with speed and assurance of satisfactory results.

The SMITH & WINCHESTER MFG. CO.

SOUTH WINDHAM, CONN.

FOR OVER A CENTURY BUILDERS OF

FOURDRINIER and CYLINDER MACHINES, PAPER BAG MACHINES, JORDAN ENGINES

WANT AND FOR SALE ADVERTISEMENTS

HELP WANTED

WHEN Managers, Superintendents and other important men in the paper industry can be better served than they have been for 11 years by us, our organization will be selected for the task. Jacob Penn, Inc., 9 Park Place, New York. t.f.

WANTED—Experienced paper salesman with following among wholesale drug houses, stationers, grocers and paper jobbers in Indiana, Michigan, Ohio and New York. Write full particulars, experience, references to Box 30-429, care Paper Trade Journal. Jn-26

WANTED AT ONCE—Southern mill wants man experienced in operating pasting and combining machine. State age, experience, salary expected, and when possible to report for duty. Address, Box 30-430, care Paper Trade Journal. Jl-10

WANTED—Research chemist who is a college graduate and has had from two to four years experience in the paper industry. Splendid opening for one qualified and desirous of doing strictly research and analytical work on special problems. Must be able to work on own initiative in organizing research data. Mill manufacturing board specialties, located in middle west. Give full particulars in first letter. Address, Box 30-417, care Paper Trade Journal. Jl-3

SALESMEN with established trade—glassine and waxed paper bags. Splendid arrangement can be made with right party. References required. Address, Box 30-206, care Paper Trade Journal. t.f.

WANTED—Experienced salesman to sell waxed papers in Philadelphia, Baltimore and vicinity. Address, Box 30-431, care Paper Trade Journal. Jn-26

CONFIDENTIAL EMPLOYMENT SERVICE—We can place assistant superintendent of production; machine and back tenders; foreman paper coating; sulphite superintendent for foreign country; beater engineer; superintendent for waxing and printing; chemist. Charles P. Raymond Service, Paper Mill Dept., 294 Washington St., Boston, Mass. Jn-26

WANTED—Plant engineer. Must be experienced in paper mill maintenance and operation, and be willing to cooperate with department heads in getting results. No applications will be considered unless full details of experience and references given. State whether married or single. Address, Box 30-432, care Paper Trade Journal. Jl-10

THOROUGHLY experienced machine tender for chip and news board mill. State references. Address, Box 30-442, care Paper Trade Journal. Jn-26

SALESMAN—High class Kraft paper salesman; a man with an established trade to call on jobbers and large consumers in Metropolitan New York desired. Splendid opportunity. Address, Box 30-446, care Paper Trade Journal. Jn-26

WANTED—Fine paper salesman. New York. Address, Box 30-448, care Paper Trade Journal. Jn-26

FOR SALE

FOR SALE

Completely equipped Paper Mill, 1 Fourdrinier Machine

Now running. Excellent shipping facilities.

Can be bought very reasonable.

Address, Box 30-451, care Paper Trade Journal. Jl-3

HELP WANTED

IF YOU are open to overtures for new connection and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty years. Send only name and address for details. R. W. Bixby, Inc., 117 Downtown Building, Buffalo, New York.

WANTED—Waxing machine boss; man fully experienced in waxing glassine and sulphite papers. Must be efficient in handling help and produce quality work. Tour work. Steady job. Address, Box 30-447, care Paper Trade Journal. Jl-3

SALESMAN

TAG BOARD, WOOD BRISTOLS, BLANKS, SPECIAL WOOD FIBRE BOARDS, ETC.

Well known Eastern Mill with a capacity of fifty tons per day requires a salesman to cover the jobbing and large converting trade in Philadelphia, Baltimore, Washington and Richmond together with other cities in this territory. Prefer a man now living in Philadelphia and one who is well known to the jobbing trade in that city and Baltimore. Some knowledge of these grades is essential and previous contact with the jobbing trade is very important.

Arrangement would become effective September 1st.

Give full particulars relative to age, previous experience and salary desired. References need not be given at this time but would be desirable. All applications will be treated as absolutely confidential.

Address, Box 30-440, care Paper Trade Journal t.f.

SITUATIONS WANTED

SUPERINTENDENT-ASSISTANT: Years of experience in the manufacturing of high grade box board, manila boards, container boards, test liner, bottle caps, etc. Good on color. Experienced in ground wood. Efficient in mill construction, old and new. Excellent production record and references from large mills. Will go anywhere. Moderate salary. Address, Box 30-434, care Paper Trade Journal. Jl-17

TOUR BOSS or machine tender on Fourdrinier grades. Excellent paper maker. Thoroughly reliable. Best references. Address, Box 30-404, care Paper Trade Journal. Jl-3

ASSISTANT SUPERINTENDENT, night superintendent or tour boss. Have 18 years experience on cylinder machine—folding box, board, vat lines and specialty boards. Or would take good job running machine. Can give best references. Address, Box 30-449, care Paper Trade Journal. Jn-26

SUPERINTENDENT OR ASSISTANT—Papermaker (German) desires position. 25 years theoretical and practical experience in making all kinds of paper and ground wood. Good on colors. 6 years in this country. Address, Box 30-386, care Paper Trade Journal. Jl-3

SUPERINTENDENT wishes to make change. Used to loft dried papers, tissue, or any specialties. Address, Box 30-443, care Paper Trade Journal. Jn-24

SITUATIONS WANTED

SUPERINTENDENT—Thoroughly practical and successful on bond, waxing, book and colored specialties, wishes to make connection. Address, Box 30-403, care Paper Trade Journal. Jl-3

GENERAL SUPERINTENDENT OR ASSISTANT—Twenty years experience. Familiar all branches sulphite pulp and paper. Knowledge mechanical engineering. Steam and electric power. Mill equipment and maintenance. Well versed cost control. A-1 references. Address, Box 30-395, care Paper Trade Journal. Jn-26

ASSISTANT SUPERINTENDENT, boss machine tender—Fourdrinier grades. 7 years experience on Kraft stock, foreign and domestic. Can give good reference as to ability. Address, Box 30-433, care Paper Trade Journal. Jl-3

EXECUTIVE-SALESMAN: Age 35, with excellent qualifications, desires mill connection. 12 years representing large manufacturer of coarse papers and specialties. Some experience in fine papers. Address, Box 30-423, care Paper Trade Journal. Jn-26

TOUR BOSS—20 years experience on all ground products, test liner, colored specialties, lined boards, asbestos, rag felt, chestnut. First-class references. Address, Box 30-435, care Paper Trade Journal. Jl-10

PULP AND PAPER MILL EXECUTIVE—General knowledge manufacturing problems, records, cost control, budget operation, steam and electric power. Knowledge mechanical engineering. 20 years experience. Best of references. Address, Box 30-436, care Paper Trade Journal. Jl-24

DESIGN ENGINEER—Experienced in mechanical equipment, piping and pumping layout problems pertaining to ground wood, sulphite and sulphate mills. Have personality and experience in directing mechanical draftsmen. Age 35. Wish position with consulting engineer. Address, Box 30-437, care Paper Trade Journal. Jn-26

SUPERINTENDENT open for position. 25 years experience manufacturing high grade folding box board, tag and manila boards and container board. Efficient at handling men and can guarantee first-class quality and production. Excellent references. Address, Box 30-306, care Paper Trade Journal. t.f.

MACHINE TENDER on Kraft or news, desires position with steady employment. Age 34, married, and steady worker. Can give A-1 reference. Will go anywhere. Address, Box 30-418, care Paper Trade Journal. Jn-26

GROUND WOOD SUPERINTENDENT, with broad practical experience in maintaining and operating efficiently mechanical pulp mills, desires position. Experience modern method making all grades ground wood. Address, Box 30-419, care Paper Trade Journal. Jn-26

WANTED

WANTED—Engine Generator Set, direct connected, about 400 H.P., 100 lb. Initial, 30 lb. back pressure, 300 KW., 2300 Volts, 60 Cycle, 3 Phase, complete with switch board and exciter. Address, Box 30-450, care Paper Trade Journal. Jn-26

FOR SALE

FOR SALE

Tissue Machine, 84" trim.

1 Cylinder, 2 Presses, 4' Crepeing Dryer, 12—48" x 88" Dryers, Reel, Calender, and Winder.

Will sell Wet End or Dryer part separate if desired.

CONSOLIDATED PRODUCTS COMPANY, INC.

15-18 Park Row New York City
Barclay 0600 Jl-3

SITUATIONS WANTED

SUCCESSFUL SUPERINTENDENT, wide experience, expert on all stocks, master of machine, mill upkeep, new and old work. All grades, boards and cylinder papers. Now open. Write me in confidence. Moderate salary. Address, Box 30-390, care Paper Trade Journal. Jl-3

MACHINE TENDER wants position. Used to book, high grade paper and tissues. Good reference. Address, Box 30-445, care Paper Trade Journal. Jn-26

TECHNICAL PRODUCTION AND SALES EXECUTIVE with exceptional experience in all kinds of paper, desires a new connection with progressive firm interested in developing their organization along the above lines. Highest credentials. Correspondence kept strictly confidential. Address, Box 30-388, care Paper Trade Journal. Jn-26

COATED PAPER—Colorist and chemist with wide practical experience in the manufacture of coated and printed fancy papers, metal papers and boxboard, desires position of responsibility with concern looking for reliable executive. Address, Box 30-347, care Paper Trade Journal. Jl-3

BOSS BEATER ENGINEER AND COLORMAN OR TOUR BOSS—25 years experience in fine and coarse paper. Desires position. Address, Box 30-389, care Paper Trade Journal. Jn-26

NOT LOOKING FOR TITLE, or credit, only remuneration for services rendered, as an originator of automatic machinery for handling paper products in any form. Also wrapping and packing machinery. Past experience and patent records and those pending tell the story. Address,, Box 30-351, care Paper Trade Journal. Jn-26

A GOOD CYLINDER MACHINE TENDER open for position. Good on any grade of stock. Address, Box 30-413, care Paper Trade Journal. Jl-10

COLORIST—Coated papers, fancy printed papers; many years practical experience in all lines of coating. Reliable, efficient, first-class references. Address, Box 30-414, care Paper Trade Journal. Jn-26

PLANT ENGINEER—Desires permanent connection with pulp and paper mill. Long experience with one of the most successful and progressive companies. Address, Box 30-401, care Paper Trade Journal. Jn-26

COARSE PAPER MAN—Open for position with wholesale wrapping paper concern. 15 years experience in every phase of wholesale wrapping paper business. Interested in any position, other than salesman, requiring executive ability, with attractive opportunity. Address, Box 30-412, care Paper Trade Journal. Jn-26

MACHINE TENDER wants to make a change. Fourdrinier or Harper machines. 45 years old. References. Address, Box 30-441, care Paper Trade Journal. Jl-3

ASSISTANT SUPERINTENDENT or night boss, wants position. Well up on all grades of paper and all makes of machines. Address, Box 30-444, care Paper Trade Journal. Jn-26

WANTED

WANTED—Coating machine, oscillating brush type, to handle 54" or more. Suction blanket flat bed preferred. Complete festoon dryer 200 ft. long, with turn around and one reel. Address, Box 30-438, care Paper Trade Journal. Jn-26

WANTED—2 W. & P. Pulpers, 2 Filter Presses and 1 Rogers Wet Machine. Address, Box 27-285, care Paper Trade Journal. t.f.

WANTED—Two or more dryers 36" or 48" x 120" or wider. Address, Box 30-189, care Paper Trade Journal. t.f.

WANTED—1 Multi-Cylinder Board Machine to trim 72"; 1 Cylinder Duster to handle 30 to 35 tons old papers in 24 hours. Give full details and price. Address, Box 30-407, care Paper Trade Journal. Jl-3

WANTED—60" No. 10 used Cameron Slitter. State price and equipment. Address, Box 30-426, care Paper Trade Journal. Jl-3

MISCELLANEOUS

WANTED—Side or odd lot rolls ten to ninety pound basis. The larger the quantity the better we like it. Address, Box 27-481, care Paper Trade Journal. t.f

CLARK MANUFACTURING COMPANY, Holyoke, Mass. Telephone 1828. Builders of cylinder moulds, couch and felt rolls, dandy rolls. We cover dandies and cylinders tight, for fast running machines. tf.

LARGE CAPITAL WANTED—To finance manufacturing of 100 per cent transparent paper. Address, "S. D.," Box 30-427, care Paper Trade Journal. Jn-26

WHAT HAVE YOU to offer in Lots, Mill Ends, Rejected, Damaged, or Cull Rolls of Paper? We deal only in such items and are in a position to buy any quantity on a cash basis. Goldman Paper and Paper Stock Co., N. W. Cor. 3rd and Wood Sts., Philadelphia, Pa. t.f.

WE BUY jobs in any kind of paper regardless of quantity. Fine paper lines such as bond, ledger, book, bristol board, and envelopes, our specialty. Paper Company, 225 W. 34th St., New York, Room 614. Telephone—Penn. 0538. t.f.

WHAT HAVE YOU TO OFFER?—We are interested in purchasing in quantities, odd lots of Kraft, news, imitation parchment and M. G. Kraft papers, rolls or sheets. Address, Box 29-696, care Paper Trade Journal. t.f.

FOR SALE

FOR SALE
PAPER MILL MACHINERY

Machine Calenders: widths 63"—128".
Super Calenders: widths 44"—72".
Moore & White 4 drum Winders, 72"-130".
Hamblet Cutters: 30" to 122".
1—84" Hamblet Duplex Cutter
1—122" Hamblet Single with Moore & White Layboy.
1—48" Farrel Board Calender.
2—Variable Speed engines: Brownell 12 x 14".
3—62" Waxing Machines.
1—62" Cameron Slitter.

FRANK H. DAVIS COMPANY
175 Richdale Avenue Cambridge, Mass.

COLLOID MILL, fifteen inch heavy Premier, turbine driven, capacity one thousand gallons per hour, perfect mechanical condition. Has seen but very slight service. Address, Waldorf Paper Products Company, St. Paul, Minnesota. Jn-26

FACTORY REBUILT CAMERON SLITTERS at greatly reduced prices. Sizes 32"—42"—50"—62"—72"—82". Send for prices and descriptive literature. Address, Box 30-219, care Paper Trade Journal.

FOR SALE—Paper mill consisting of wet machine equipment, suitable for binder's board mill. Located in Massachusetts, between Boston and Fall River. Address Box 29-556, care Paper Trade Journal. t.f.

PAPER COATING MACHINERY—Waxing Oiling, Gumming, Gluing, Asphalt Duplexing, Varnish Insulating, Pyroxlin compounds, etc. Laboratory Coating and Treating machines. High Speed, new improvement. MAYER COATING MACHINES COMPANY, Inc., Rochester, N. Y. t.f.

COMPLETELY EQUIPPED Binders Board Mill, consisting of Beaters, Chests, Wet Machines, Trimmers, Drying equipment; Good power plant and water supply—within easy trucking distance of New York City. Can be had for low price. Address, Box 30-394, care Paper Trade Journal. Jn-26

FOR SALE OR ROYALTY—United States Patent 1,733,448 of Oct. 29th, 1929, automatic log meter which measures pulp wood logs passing along the conveyor and records them in the unit of a cord. Address, Box 30-420, care Paper Trade Journal. Jn-26

FOR SALE

MOTORS—Four 75 HP., 720 RPM., 220 or 440 volt, 60 cycle, 3 phase, Geneal Electric, Type I, Form K, motors, with chain drives. One 200 HP., 450 RPM., 440 volt, 60 cycle, 3 phase, General Electric. Many others. All guaranteed. Write for list. V. M. NUSSBAUM & CO., FORT WAYNE, INDIANA. Jn-26

FOR SALE—Codrington Cartoning and Sealing machine for sanitary napkins. Will automatically open, fill and seal carton size 6½" x 3¼" x 9". Address, Box 30-422, care Paper Trade Journal Jl-3

FOR SALE—Several hundred 24", 22" and 19" steel capped Fibre Cores, 3" inside diameter and ⅜" wall, some new and all in good condition Address, Wm. H. Vinton & Son, Brattleboro, Vt. t.f.

FOR SALE—1 Carlson Disc Evaporator, double, 6'3" x 17'11", complete, $1200.00. 1 Carlson Rotary Incinerator, 9' diam. x 20' long, brick lined, complete, $1200.00. 1 Dry Vacuum Pump 12" x 20" x 12", $800.00. J. C. Pickens, Nitro, W. Va. Jl-17

FOR SALE—Complete Paper Mill with Fourdrinier machine trimming 74". Excellent shipping facilities. Mill now running, short distance from New York City. Address, Box 30-439, care Paper Trade Journal. Jl-3

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
10 East 39th St.,
New York, N. Y.

FOR SALE

SPECIALS

3—Complete Paper Plants; now running.
1—B. & C. Fourdrinier Paper Machine, 79" wire.
1—Yankee Fourdrinier, wire 78"x32'8", dryer 8' dia. x 78" face.
1—Harper Fourdrinier, 110" wire.
5—Warren Improved Double Drum Winders, 154" face.
1—Bagley & Sewall Drum Winder, 120".
1—Double Drum Winder, 82" face.
1—Holyoke 72" 9 roll Super Calender.

BEATERS

3—Niagara, 2000 lbs. each; 5 Jones, Iron tub, 1000 lbs. each; 3 Dilts and 1 Noble & Wood, 1000 lbs. each; 1 Horne and 1 Waterous, 500 lbs. each.

SUPER CALENDERS

1—Holyoke 9 roll, 72" face; 1 Holyoke 9 roll, 44" face; 1 Holyoke 7 roll, 44" face.

JORDANS

1—Horne Standard; 1—Horne, large.

SCREENS

5—10 plate Harmon
7—10 plate Packers
6—12 plate Beloit
1—Spangenburg Rotary
1—Ruth Centrifugal
2—Bird Rotary Pulp

SLITTERS AND REWINDERS

1—65" Cameron
1—80" Kidder
1—58" Koegel
2—60" Koegel
1—45" Koegel
1—180" Moore & White

WASHERS

1—75" Improved Paper Machine Co., 4 cylinder.

MISCELLANEOUS

Chippers, Grinders, Coating Machines, Flat Cutters, Rotary Cutters, Cylinder Moulds, Dryers, Tube Machines, Wet Machines, etc.

The above are a few selected items from our large list. Ask us for any machines not listed.

We also have a complete line of Digesters, Rod and Tube Mills, Rotary Filters, Rotary Sulphur Burners, Evaporators, Pulp Mixers, Rotary Kilns and Dryers, Barkers and Power Plant Equipment.

CONSOLIDATED PRODUCTS COMPANY, INC.
15-18 Park Row, New York City Barclay 0600
We Pay Cash for your Idle Equipment—
Single Items or Complete Plants.

MERRIMAC CHEMICAL COMPANY
148 STATE STREET
BOSTON MASS.
COMMERCIAL ALUM
CMC
IRON FREE ALUM

E. D. JONES & SONS CO.,
PITTSFIELD, MASS.
MANUFACTURERS OF
PAPER MILL MACHINERY

Your Card in This
Space Will Bring
Results

SAVEALLS
AMERICAN AND OLIVER CONTINUOUS FILTERS
DECKERS
THICKENERS
OLIVER UNITED FILTERS INC.
HAZLETON, PA. OAKLAND, CAL.
BLEACH WASHERS
SAN FRANCISCO NEW YORK CHICAGO

TENSILASTIC
RUBBER ROLLS
Laboratory Controlled At Every Stage of Processing
AMERICAN WRINGER CO., INC., Woonsocket, R. I.

STEBBINS
IF IT'S A LINING JOB—
ENGINEERING CALL ON & MFG. CO.
SEATTLE, WASH. STEBBINS WATERTOWN, N.Y.

FOR SALE
(In Scotch Plains, N. J., 20 Minutes to Newark)

WILL TAKE STOCK IN CORPORATION IN LIEU OF CASH FOR PARTLY EQUIPPED MILL USED TO MANUFACTURE BINDER BOARD AND PAPER SPECIALTIES. UNLIMITED WATER SUPPLY. GOOD BOILERS. 22,000 SQUARE FEET FLOOR SPACE ON TWO FLOORS. SPRINKLERED. CHEAP. CAN BE USED TO MANUFACTURE CHEMICALS, ETC.

GROSS PAPER CO., Inc.
20 CLINTON ST.,
NEWARK, N. J.
Telephone: Mitchell 3870

St. Regis Paper Company

Daily Capacity, 525 Tons

Newsprint

Catalog and Directory

Packers Oiled Manila

Fibre Wrapping

R. R. Writing—Poster and

Construction Papers, Cover

and Other Specialties

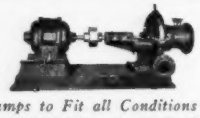
General Sales Office
60 East 42nd St.
NEW YORK

Telephone Number: Vanderbilt 8511

Western Sales Office
230 North Michigan Avenue, Chicago, Ill.
Telephone, Randolph 0534

FREDERICK PUMPS
The Frederick Iron & Steel Co., Frederick, Maryland

Centrifugal & Triplex Pumps



For All Purposes

Designing Pumps to Fit all Conditions our Specialty
HAYTON PUMP & BLOWER CO.
APPLETON, WIS.

Classified Index To Advertisers

ABRASIVES
Norton Co.
ACCOUNTANTS
Scovell, Wellington & Co.
ACETATE OF LEAD
Grasselli Chemical Co., The
ACID ACCUMULATORS
Stebbins Engineering & Mfg. Co.
ACID FITTINGS (Bronze)
Baker Manufacturing Corp.
Murray, D. J. Mfg. Co.
ACID FITTINGS
Stebbins Engineering & Mfg. Co.
ACID PUMPS
De Laval Steam Turbine Co.
Hayton Pump & Blower Co.
Oliver United Filters Inc.
Schutte & Koerting Co.
ACID PROOF BRICK & TILE
Stebbins Engineering & Mfg. Co.
ACID PROOF LININGS
Stebbins Engineering & Mfg. Co.
ACID SYSTEMS
Jenssen Company, G. D.
ACID TOWERS
Stearns Lumber Co., A. T., The
AGALITE
Union Talc Co.
AGITATOR EQUIPMENT
Valley Iron Works
AIR DRYING MACHINERY
Waldron, John, Corp.
AIR HEATING AND COOLING UNITS
Covell-Hanchett Co.
Schutte & Koerting Co.
AIR PREHEATING UNITS
Edge Moore Iron Co.
Ross Engineering Corp., J. O.
AIR COOLERS
Schutte & Koerting Co.
AGITATORS
Emerson Mfg. Co.
Hayton Pump & Blower Co.
Hauser-Stander Tank Co.
Mid-West Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works Co.
AIR BURNING SYSTEMS
Schutte & Koerting Co.
AIR HEATING TUBES
Schutte & Koerting Co.
AIR PREHEATERS
Babcock & Wilcox Co.
ALUM
General Chemical Co.
Kalbfleisch Corporation, The
Pennsylvania Salt Mfg. Co.
ALUMINUM SULPHATE (Iron Free)
Grasselli Chemical Co., The
ALUMINUM SULPHATE (Commercial)
Grasselli Chemical Co., The
ANALYSIS AND TESTS
Electrical Testing Laboratories
Little, Inc., Arthur D.
U. S. Testing Laboratories
AQUA AMMONIA
Grasselli Chemical Co., The
ARCHITECTS AND ENGINEERS
Continental Industrial Engineers, Inc.
Ferguson Co., H. K.
Ferguson, Hardy S.
Hardy, George F.
Jenssen Company, G. D.
Johnson & Wierk, Inc.
Lefren, K. A.
Lyden, Frank P.
Orbison & Orbison
Simons, V. D.
Smith, F. L.
Stebbins Eng. & Mfg. Co.
Taylor, H. S.
ASBESTINE PULP
International Pulp Co.
ASH BUNKERS
Link-Belt Co., The
ASH CONVEYORS
Link-Belt Co., The
Weller Mfg. Co.
ASH GATES (Water Collecting)
Link-Belt Co., The
ASH HOPPERS
Link-Belt Co., The
AUTOMATIC AIR DEVICES
Schutte & Koerting Co.
AUTOMATIC SAW SHARPENERS
Covell-Hanchett Co.
Samuel C. Rogers
AUTOMATIC SCALES
Richardson Scale Co.
AUTOMATIC WEB GUIDES
Waldron, John, Corp.
AUTOMATIC WHITE WATER SAMPLERS
Montague Machine Co.
AUTOMATIC WATER JETS FOR CLEANING
Montague Machine Co.
BABBITT METAL
Monarch Metal Co., The
BACKING WIRES
Appleton Wire Works
Eastwood Wire Corp.
International Wire Works
Lindsay Wire Weaving Co.
Tyler Co., W. S. of America
BALING PRESSES
Ohio Cultivator Co.
BALL BEARINGS
Norma-Hoffman Bearings Co.
Hyatt Roller Bearing Co.
S. K. F. Industries
Timken Roller Bearing Co.
BARIUM CHLORIDE
Grasselli Chemical Co., The
BARKERS
Allis Chalmers Mfg. Co.
Appleton Machine Co., The
Baker Manufacturing Corp.
Carthage Machine Co.
Green Bay Barker Machine & Tool Works.
Manitowoc Eng. Works
Valley Iron Works Co.
BARKER KNIVES
Bolton, John W. & Sons, Inc.
BARKING DRUMS
Baker Manufacturing Corp.
Biggs Boiler Works
Fibre Making Process, Inc.
Manitowoc Eng. Works
Murray, D. J. Mfg. Co.
BARK PRESSES
Fibre Making Process, Inc.
BEARING METAL
Monarch Steel Co., The
BEARINGS (Tapered Roller)
Timken Roller Bearing Co.
BEARINGS (Trust)
Timken Roller Bearing Co.
BEARINGS, ROLLER
Hyatt Roller Bearing Co.
Timken Roller Bearing Co
Weller Mfg. Co.
BEATING ENGINES
Dayton Beater & Hoist Co.
Dilts Machine Works, Inc
Downingtown Mfg. Co.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Mid-West Machine Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works Co.
BEATER LININGS
Stebbins Engineering & Mfg. Co.
BEATER BED PLATES
Bolton, John W. & Sons, Inc.
Dayton Beater & Hoist Co.
Dilts Machine Works, Inc.
Emerson Mfg. Co.
Mid-West Machine Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Taylor, Stiles & Co.
Valley Iron Works Co.
BEATER ENGINE BARS
Bolton, John W., & Sons, Inc.
Dayton Beater & Hoist Co.
Dilts Machine Works, Inc.
Emerson Mfg. Co.
Mid-West Machine Co.
Shartle Bros. Machine Co.
Taylor, Stiles & Co.
Valley Iron Works Co.
BEATER HOODS
Bird Machine Co.
Dayton Beater & Hoist Co.
Dilts Machine Works, Inc.
Shartle Bros. Machine Co.
BEATER PROPELLER
Noble & Wood Machine Co.
BEATER ROLLS
Dayton Beater & Hoist Co.
Emerson Mfg. Co.
Mid-West Machine Co.
Shartle Bros. Machine Co.
BEATER ROLL GRINDERS
Dayton Beater & Hoist Co.

Classified Index To Advertisers

BELT LACING
Graton & Knight Co.
BENZOYL CHLORIDE
Hooker Electrochemical Co.
BENZYL ALCOHOL
Hooker Electrochemical Co.
BENZOATE OF SODA
Hooker Electrochemical Co.
BENZOIC ACID
Hooker Electrochemical Co.
BENZOYL CHLORIDE
Hooker Electrochemical Co.
BICARBONATE OF SODA
Michigan Alkali Co.
BLANC FIXE
Wishnick-Tumpeer, Inc.
BLEACH
Grasselli Chemical Co., The
BLEACH EJECTORS
Perkins & Sons, Inc., B. F.
BLEACHING BOILERS
Biggs Boiler Works Co.
Manitowoc Eng. Works
BLEACHER LININGS
Stebbins Engineering & Mfg. Co.
BLEACHING POWDER
Hooker Electrochemical Co.
Mathieson Alkali Works, Inc.
BLEACHING PROCESS
Electroc Bleaching Gas Co.
Hooker Electrochemical Co.
BLEACHING TANKS
Biggs Boiler Works.
BLOW PIPING
Biggs Boiler Works
Manitowoc Eng. Works
Moore & White Co.
BLOWERS (CENTRIFUGAL)
De Laval Steam Turbine Co.
General Electric Corp.
Ross Engineering Corp., J. O.
BOARD MACHINES
Oliver United Filters, Inc.
BOILERS
Babcock & Wilcox Co.
Baker Manufacturing Corp.
Badenhausen Corporation
Biggs Boiler Works Co.
Edge Moor Iron Co.
BOX ELECTRIC HOISTS
Box Crane & Hoist Corp.
BOX TANKS
Stearns Lumber Co., A. T., The
BRASS COLLAPSIBLE SHAFTS
Moore & White Co., The
BREAKER BEATERS
Shartle Bros. Machine Co.
BRICK (Refractory)
Lavino, E. J. & Co.
BRONZE BUSHINGS
Shenango-Penn Mold Co.
BRONZE (Centrifugal)
Shenango-Penn Mold Co.
BRONZE CYLINDERS
Shenango-Penn Mold Co.
BRONZE FILLINGS
Bolton & Sons, Inc., John W.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
BRONZE TUBES
Shenango-Penn Mold Co.
BROWN COLORS (Sap & Van Dyke)
Wichnick-Tumpeer, Inc.
BUCKETS (ELEVATOR)
Allis Chalmers Mfg. Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co., The
BULL SCREENS
Fibre Making Process, Inc.
Green Bay Barker Machine & Tool Works
BUNDLING PRESSES
Hudson Sharp Machine Co.
BURRS
Roberts Mfg. Co., F. W.
C. P. AMMONIUM HYDROXIDE
Grasselli Chemical Co., The
C. P. HYDROCHLORIC ACID
Grasselli Chemical Co., The
C. P. NITRIC ACID
Grasselli Chemical Co., The
BEATER VALVES
Dayton Beater & Hoist Co.
BELT CEMENTS
Graton & Knight Co.
BELTING
Dayton Rubber Manuf. Co.
Goodrich Rubber Co.
Goodyear Tire & Rubber Co.
Graton & Knight Co.
Rhoads & Sons, J. E.
BELT DRESSING
Graton & Knight Co.
C. P. SULPHURIC ACID
Grasselli Chemical Co., The
CABINETS
Griffith-Hope Co.
CALENDER ROLLS
Butterworth & Sons Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Norwood Engineering Co.
Perkins & Son, Inc., B. F.
Textile Finishing Mach. Co.
Waldron Corp., John
CALENDER ROLL GRINDERS
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Perkins & Son, Inc, B. F.
Ticonderoga Machine Works
CALENDERS
Emerson Mfg. Co.
Moore & White Co.
Norwood Engineering Co.
Shartle Bros. Machine Co.
CALIPERS (Micrometer Roll)
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
CARBON BLACK
Huber Co., Inc., J. M.
Wishnick-Tumpeer, Inc.
CAR PULLERS
Weller Mfg. Co.
CASEIN
Hurst & Co., Inc., Adolphe
Kalbfleisch Corp., The
Land O' Lakes
CASTINGS (Brass Bronze, Iron)
Baker Manufacturing Corp.
Link-Belt Co., The
Mantague Machine Co.
CAUSTIC SODA
Arnold Hoffman Co., Inc.
Diamond Alkali Co.
Grasselli Chemical Co., The
Hooker Electrochemical Co.
Mathieson Alkali Works, Inc.
Solvay Process Co.
CAUSTICIZING PLANTS
Goslin-Birmingham Mfg. Co.
CEMENT (High Temperature)
Lavino, E. J. & Co.
CENTRIFUGAL MACHINERY (Special)
Allis Chalmers Mfg. Co.
De Laval Steam Turbine Co.
CENTRIFUGAL REFINERS
Bird Machine Co.
Tolhurst Machine Works
CENTRIFUGAL PUMPS
Hayton Pump & Blower Co.
CHAIN DRIVES
Eastern Chain Works, Inc.
Jeffrey Mfg. Co.
Link-Belt Co., The
Weller Mfg. Co.
CHAINS
Eastern Chain Works, Inc.
CHEMICALS, COLORS, ETC.
Arnold Hoffman & Co., Inc.
E. I. DuPont de Nemours & Co., Inc.
Diamond Alkali Co.
Electro Bleaching Gas Co.
General Dyestuff Corp.
Heller & Merz Co.
Hooker Electrochemical Co.
Hurst & Co., Inc., Adolphe
Kalbfleisch Corporation, The
Lennig & Co., Inc., Chas.
Mathieson Alkali Works, Inc.
Solvay Process Co.
Williams & Co., C. K.
Wishnick-Tumpeer, Inc.
CHEMICAL (Pulp Mill Equipment)
Jenssen Company, G. D.
Stebbins Engineering & Mfg. Co.
CHEMICALS (Cooking)
Harbaugh Process Co., The
CHEMISTS
Electric Testing Laboratories
CLAY (China)
Edgar Bros. Co.
English China Clays Sales Corp.
Huber Co., Inc., J. M.
Little, Inc., Arthur D.
United States Testing Lab.
Vanderbilt Co., R. T.
CLAY (Filler)
Huber Co., Inc., J. M.
CHIPPERS
Baker Manufacturing Corp.
Murray, D. J. Mfg. Co.
Ryther & Pringle Co.
Valley Iron Works Co.
CHIPPER KNIVES
Bolton, John W. & Sons, Inc.
CHIP SCREENS
Appleton Wire Works
Eastwood Wire Corp.

The B C-DC. QUALITY PULPS

"HAFSLUND BEAR" Bleached Sulphite

"FORSHAGA" Bleached Sulphite

"HURUM SPECIAL" Extra Strong Kraft

"BAMBLE" Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

WOOD PULP AGENTS

PRICE & PIERCE, Ltd.,

17 EAST 42ND ST.
NEW YORK

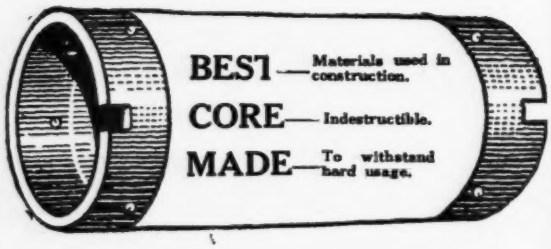
SHIPPING INSURANCE

The Use of

ELIXMAN CORES

protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

SHIPPING INSURANCE



Your two sources of supply are

Canadian Elixman Company
HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK
and LITHOGRAPHIC
PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers.

also

Bleached Spruce Sulphite and Soda, Kraft Pulp

230 Park Ave. New York — 35 East Wacker Drive Chicago

503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

Classified Index To Advertisers

International Wire Works
Lindsay Wire Weaving Co.
Murray Mfg. Co., D. J.

CHLORINE
Electro Bleaching Gas Co.
Hooker Electrochemical Co.
Pennsylvania Salt Co.

CLAM SHELL BUCKETS
Link-Belt Co., The

CLAY SIFTERS
Roto Spray Mfg. Co.

CLEANING MATERIALS
Oakite Prod., Inc.

CLUTCH PULLEYS
Foote Bros. Gear & Machine Co.

CYLINDER MOULDS
Emerson Mfg. Co.

CO_2 RECORDERS
Cambridge Instrument Co.

COAL METERS
Bailey Meter Co.

COATING MACHINERY
Waldron Corporation, John

COGS
Bowsher, N. P., The

COLLAPSIBLE WINDER SHAFTS
Baker Manufacturing Corp.
Murray D. J. Mfg. Co.

COLOR MIXING EQUIPMENT
Waldron, John, Corp.

COMBUSTION CONTROL
Cambridge Instrument Co.

COMPRESSORS (Air)
Allis Chalmers Mfg. Co.
General Electric Co.
Nash Engineering Co., The
Oliver United Filter, Inc.

COMPRESSORS (Centrifugal)
De Laval Steam Turbine Co.

CONDENSERS
Allis Chalmers Mfg. Co.
Schutte & Koerting Co.

CONDENSERS (Steam)
Allis Chalmers Mfg. Co.
Schutte & Koerting Co.
Westinghouse Electric & Mfg. Co.

CONSULTING ENGINEERS
Austin Co., The
Continental Industrial Engineers, Inc.
Ferguson Co., H. K.
Hardy, Geo. F.
Johnson & Wierk, Inc.
Lefren, K. A.
Little, Inc., Arthur D.
Lyden, Frank P.

CONTINUOUS BEATERS
Emerson Mfg. Co.
Mid-West Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works Co.

CONTROLS (Electric)
Cambridge Instrument Co.
Cutler-Hammer Mfg. Co.
Westinghouse Electric & Mfg. Co.

CONVEYOR WEIGHTS
Richardson Scale Co.

CONVEYOR PIPE
Naylor Pipe Co.
Taylor Forge and Pipe Works

CONVEYORS
Jeffrey Mfg. Co.
Link-Belt Co., The
Murray, D. J., Mfg. Co.

CONVEYORS (Trim)
Ross Engineering Corp., J. O.

COOKING & RECOVERY PROCESS
Ross Engineering Corp., J. O.
Stebbins Engineering & Mfg. Co.

CORES (Paper)
Elixman Paper Co.

CORES (Steel)
Fabricated Steel Products Co.

CORKBOARD (Insulation)
Armstrong Cork & Insulation Co.

COST ENGINEERS
Scovell, Wellington & Co.

COTTON CALENDER ROLLS
Norwood Engineering Co.
Perkins & Son, Inc., B. F.
Textile Finishing Machinery Co.

COUCH ROLLS
Americas Wringer Co.
Bagley & Sewall Co.
Baker Manufacturing Corp.
Emerson Mfg. Co.
Hunt Machine Co., Rodney
Moore & White Co.
Shartle Bros. Machine Co.

COUPLINGS
Baker Manufacturing Corp.
De Laval Steam Turbine Co.
Foote Bros. Gear & Machine Co.
Link-Belt Co., The
Nuttall Co., R. D.
Palmer-Bee Co.

CRANES (Electric)
Box Crane & Hoist Co.

CRANES (Hand Powered)
Box Crane & Hoist Co.

CREPING MACHINES
Gibbs-Browers Co., Inc.
Hudson Sharp Co.
Paper Converting Machinery
Waldron Corporation, The

CUT-OFF SAWS
Murray, D. J. Mfg. Co.

CYLINDER COVERS
Green Bay Wire Works

CYLINDER, RAILROAD AND DEVIL DUSTER
Moore & White Co., The

CYLINDER DRIVES
Baker Manufacturing Corp.
Moore & White Co., The

CYLINDER MOULDS
Baker Manufacturing Corp.
Glens Falls Machine Co.
Montague Machine Co.
Shartle Bros. Mach. Co.

CYLINDER VALVES
Green Bay Foundry & Mach. Works

CYLINDER WIRES
Appleton Wire Works
Eastwood Wire Corp.
International Wire Works
Lindsay Wire Weaving Co.
Tyler Co., W. S.

DAMPENERS
Norwood Engineering Co.
Perkins & Sons, Inc., B. F.

DECKERS
Baker Manufacturing Corp.
Glens Falls Machine Co.
Goslin-Birmingham Mfg. Co.
Oliver United Filters Inc.
Shartle Bros. Machine Co.
Valley Iron Works

DEEP WELL PUMPS
Cook, A. D. & Co.

DIE CUTTERS
Appleton Machine Co., The
Biggs Boiler Works

DIFFUSERS
Biggs Boiler Works
Manitowoc Eng. Works

DIGESTER FITTINGS
Baker Manufacturing Corp.
Stebbins Engineering & Mfg. Co.

DIGESTER LININGS
Stebbins Engineering & Mfg. Co.

DIGESTERS (Sulphate and Sulphite)
Biggs Boiler Works
Manitowoc Eng. Co.

DISPENSERS
Griffith-Hope Co.

DOCTORS
Bird Machine Co.
Lodding Engineering Co.

DREDGE PIPE
Naylor Spiral Pipe Co.
Taylor Forge & Pipe Works

DRIVES (Paper Machinery)
Allis Chalmers Mfg. Co.
Bird Machine Co. (Pullman Drive Div.)
Jeffrey Mfg. Co.
Link-Belt Co., The
Philadelphia Gear Works
Shartle Bros. Machine Co.
Westinghouse Electric Co.

DRIVES (SHORT CENTER)
Bird Machine Co., (Pullman Drive Div.)
Link-Belt Co., The

DRIVES (Spiral)
Philadelphia Gear Works

DRIVING SYSTEMS
Philadelphia Gear Works
Westinghouse Electric & Mfg. Co.

DRUM WINDERS & SLITTERS
Moore & White Co.

Classified Index To Advertisers

DRYER EXHAUSTS
Nash Engineering Co., The
Walmsley & Co. (Canada) Limited, Charles

DRYER JOINTS
Baker Manufacturing Corp.
Shartle Bros. Machine Co.

DRYERS
Baker Manufacturing Corp.
Biggs Boiler Works Co.
Emerson Mfg. Co.
Manitowoc Eng. Works
Shartle Bros. Machine Co.
Walmsley & Co. (Canada) Limited, Charles

DRYING SYSTEMS
Pickles, W. F.
Penberthy Injector Co.
Ross Engineering Co., J. O.
Stickle Steam Specialties Co.
Waldron Corporation, The

DUST COLLECTOR PIPE
Naylor Pipe Co.
Taylor Forge & Pipe Works

DUSTING MACHINERY
Jones & Sons Co., E. D.
Norwood Engineering Co.

DYES, (ANILINE)
Heller & Merz
National Aniline & Chem. Co.

EARTH COLORS
Wichnick-Tumpeer, Inc.

ECONOMIZERS
Babcock & Wilcox Co.

ELECTRIC TRAVELING CRANES
Box Crane & Hoist Corp.

ELECTRIC EQUIPMENT
Allis Chalmers Mfg. Co.
Cutler-Hammer Mfg. Co.
Fairbanks-Morse & Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC HOIST (Box)
Box Crane & Hoist Corp.

EMBOSSING CALENDARS
Norwood Engineering Co.
Perkins & Soss, Inc., B. F.
Textile Finishing Machinery

EMBOSSING MACHINE (Napkin)
Paper Converting Machine Co.

ENGINEERS
Lyden, Frank P.

ENGINES (STEAM)
Allis Chalmers Mfg. Co.
Murray Iron Works
Walmsley & Co. (Canada) Limited, Charles

ENVELOPE MACHINES
Potdevin Machine Co.

EVAPORATORS
Goslin-Birmingham Mfg. Co.
Murray, D. J. Mfg. Co.

EXTRACTORS
Baker Manufacturing Corp.
Dayton Beater & Hoist Co.
Valley Iron Works Co.
Mid-West Machine Co.

FANS
Hartzell Propeller Co.
Ross Engineering Corp., J. O.
Westinghouse Electric & Mfg. Co.

FAN PUMPS
Lawrence Mach. and Pump Co.
Valley Iron Works Co.

FANS (Ventilating)
Perkins & Son, Inc., B. F.
Ross Engineering Corp., J. O.

FEED WATER HEATER
Stickle Steam Specialties Co.

FELT CARRIER ROLLS
American Wringer Co.

FELT CONDITIONERS
Baker Manufacturing Corp.

FELT TIGHTENERS
Morey Paper Mills Supply Co.

FELTS
Morey Paper Mills Supply Co.

FELTS AND JACKETS
Albany Felt Co.
Appleton Woolen Mills
Bulkley, Dunton & Co.
Draper Bros. Co.
Fitchburg Duck Mills
Huyck & Son, E. C.
Knox Woolen Company
Orr Felt & Blanket Co.
Shuler & Benninghofen
Turner, Halsey Co.
Waterbury Felt Co.

FERRIC CHLORIDE
Hooker Electrochemical Co.
Eastwood Wire Corp.
International Wire Works

FILTERS
Filtration Engineers, Inc.
Oliver United Filters, Inc.

FILTER WIRES
Appleton Wire Works
Lindsay Wire Weaving Co.
Oliver United Filters Inc.
Tyler Co., W. S.

FILTERING SYSTEMS
Hungerford & Terry, Inc., The
Goslin-Birmingham Mfg. Co.
Norwood Engineering Co.
Oliver United Filters Inc

FLANGES (Pipe Forged Steel)
Taylor Forge & Pipe Works

FLAT SCREENS
Glen Falls Machine Co.

FLEXIBLE COUPLINGS
Allis Chalmers Mfg. Co.
Baker Manufacturing Corp.
De Laval Steam Turbine Co.
Emerson Mfg. Co.
Foote Bros. Gear & Machine Co.
Jones Foundry & Machine Co., W. A.
Palmer Bee Co.

FLOOR TILE (Non-Slip)
Norton Co.

FLOW METER
Bailey Meter Co.
General Electric Co.

FLY BARS
Bolton, John W. & Sons, Inc.
Dayton Beater & Hoist Co.
Jones & Sons Co., E. D.
Mid-West Machine Co.
Noble & Wood Machine Co.

FOLDING MACHINES (NAPKIN)
Paper Converting Machine Co.

FOLDING MACHINES (Single Type)
Norwood Engineering Co.

FOLDING MACHINES
Waldron, John, Corp.

FOLDING TESTERS
Foreign Paper Mills, Inc.

FOURDRINIER WIRES
Appleton Wire Works
Eastwood Wire Corp.
Green Bay Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Neumeyer & Dimond
Tyler Co. W. S.

FREENESS TESTERS
Foreign Paper Mills, Inc.

FRENCH OCHRE
Wishnick-Tumpeer, Inc.

FRICTION CALENDERS
Norwood Engineering Co.
Perkins & Son, Inc., B. F.

FRICTION CLUTCHES
Allis Chalmers Mfg. Co.
Foote Bros. Gear & Machine Co.
Jones Foundry & Machine Co., W. A.
Link-Belt Co., The
Moore & White Co.
Weller Mfg. Co.

FURNACES (Vertical Jet)
Stratton Engineering Corp.

GATE VALVES
Carthage Machine Co.

GAUGES (Thickness)
Perkins & Son, Inc., B. F.

GEARS
De Laval Steam Turbine Co.
Foote Bros. Gear & Machine Co.
Jeffrey Mfg. Co.
Jones Foundry & Machine Co. W. A.
Link Belt Co., The
Nuttall Co., R. D.
Philadelphia Gear Works
Weller Mfg. Co.

GEARS (Machine Cut)
De Laval Steam Turbine Co.
Foote Bros. Gear & Machine Co.
Jones Foundry & Machine Co., W. A.
Link-Belt Co., The
Nuttall Co., R. D.
Palmer-Bee Co.
Philadelphia Gear Works
Walmsley & Co. (Canada) Limited, Charles

GEARS AND PINIONS
Link-Belt Co., The
Moore & White Co.
Philadelphia Gear Works

GENERATORS
Allis Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.

POTDEVIN

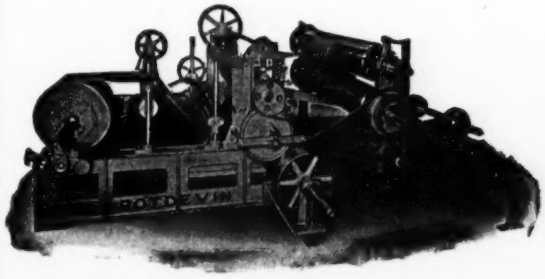
PAPER WAXING MACHINERY

Three Widths—52" - 64" - 80"

LIGHT OR HEAVY COATING

WET OR DRY WAX

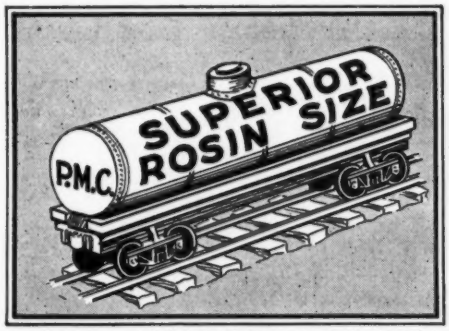
ONE OR BOTH SIDES



POTDEVIN MACHINE CO.

1223 38th Street, Dept. 4, Brooklyn, N. Y., U. S. A.

Phones: Windsor 1700, 1701, 1702

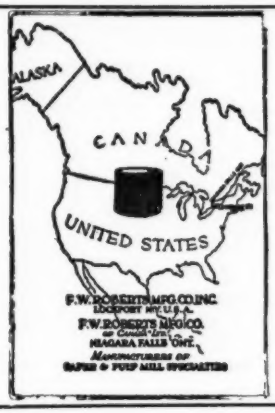


20 plants to serve You

PAPER MAKERS CHEMICAL CORP.

Kalamazoo, Michigan

B U R R S



B U R R S

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO
(Incorporated)
75 East 45th Street, New York City
Mine: Gulf, Matagorda County, Texas

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.

Woolen manufacturers since 1856

Classified Index To Advertisers

Westinghouse Electric & Mfg. Co.

GRANITE PLATES
Green Bay Foundry & Mach. Works

GREASES
Cook's Sons, Inc., Adam
Shell Petroleum Corporation

GRATING (SIDEWALK)
Hendrick Mfg. Co.
Walmsley & Co. (Canada) Limited, Charles

GREY IRON CASTINGS
Nortmann-Duffke Co.

GRINDERS (Automatic and Magazine)

GRINDING WHEELS
Norton Co.

GROUND WOOD
Borregaard Co., Inc.

GUIDES (FELT)
Moore & White Co.
Shartle Bros. Machine Co.

GUIDES (WIRE)

GUMMING AND GLUING MACHINERY
Potdevin Machine Co.
Shartle Bros. Machine Co.
Waldron Corporation, John

HALF ROUND TANKS
Stearns Lumber Co., A. T., The

HANGERS
Link-Belt Co., The

HAND CRANES
Box Crane & Hoist Corp.

HAND TRUCKS
Fairbanks Co.

HEAT EXCHANGERS
Schutte & Koerting Co.

HEAT TREATING
Foote Bros. Gear & Machine Co.

HEATING AND VENTILATING SYSTEMS
Air Preheater Corp.
Ross Engineering Corp., J. O.

HIGH DENSITY THICKENERS
Oliver United Filters, Inc.
Moore & White Co.

HOIST (Chain)
Box Crane & Hoist Corp.

HOISTS (Electrical)
Allis Chalmers Mfg. Co.

HOIST (Headgate)
Dayton Beater & Hoist Co.
Hunt Machine Co., Rodney

HOISTS (ELECTRIC)
Box Crane & Hoist Corp.
General Electric Co.
Weller Mfg. Co.

HYDRO-ELECTRIC DEVELOPMENTS
Johnson & Wierk, Inc.
Montague Machine Co.
Smith S. Morgan

HYDRAULIC TURBINES
Allis Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Hunt Machine Co., Rodney
Smith S. Morgan

HYDROGEN-ION APPARATUS
Cambridge Instrument Co.

HYGROMETERS, PAPER STOCK
Cambridge Instrument Co.

HYGROMETER AND TENSILE TESTERS
Foreign Paper Mills, Inc.

INCINIRATORS
Manitowoc Eng. Works

INJECTORS (Boiler Feed)
Penberthy Injector Co.
Schutte & Koerting Co.

INSPECTIONS
Electrical Testing Lab.
United States Testing Co.

INSULATION (Walls & Roofs)
Armstrong Cork & Insulation Co.

JORDAN ENGINES
Appleton Machine Co.
Emerson Manufacturing Co.
Jones & Sons Co., E. D.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works
Walmsley & Co. (Canada) Limited, Charles

JORDAN FILLINGS
Bahr Bros. Mfg. Co., The
Bolton, John W. & Sons, Inc
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Mid-West Machine Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works

JORDAN INTAKE REGULATORS
Baker Manufacturing Corp.

KNIVES, ETC.
Baker Manufacturing Corp.
Bolton & Sons Co., J. W.
Dilts Machine Works, Inc.
Shartle Bros. Machine Co.
Taylor, Stiles & Co.

KNIFE GRINDERS
Covell-Hanchett Co.
Samuel C. Rogers
Shartle Bros. Machine Co.

KNOT SAWING MACHINES
DeZurik Shower Co., The

KNOTTERS
Fibre Making Process, Inc.
Glens Falls Machine Co.

LABORATORY EQUIPMENT
Emerson Mfg. Co.
Thwing Instrument Co.
Valley Iron Works

LAY BOYS
Moore & White Co.

LEATHER for BELT REPAIRS
Graton & Knight Co.

LEATHER PACKING
Graton & Knight Co.

LINING (Furnace)
Lavino, E. J. & Co.

LIME MUD FILTERS
Oliver United Filters Inc.

LIQUID CHLORINE
Arnold, Hoffman & Co., Inc.
Electro Bleaching Gas Co.
Hooker Electrochemical Co.
Kalbfleisch Corp.
Mathieson Alkali Works, Inc.

LOFT DRYERS
Ross Engineering Corp., J. O.

LUBRICANTS
Cook's Sons, Inc., Adam
Shell Petroleum Co.
Standard Oil Co. of Indiana
Texas Co.
Vacuum Oil Co.

MECHANICAL STOKERS
Babcock & Wilcox Co.
Combustion Engineering Corp.
International Combustion Engineering Corp.
Westinghouse Electric & Mfg. Co.

METAL (Babbitt)
Monarch Metal Co., The

METERS (Coal)
Bailey Meter Co.

MONO RAIL SYSTEMS
Palmer-Bee Co.

MOTORS
Allis Chalmers Mfg. Co.
General Electric Co.
Perkins & Son, Inc., B. F.
Westinghouse Electric & Mfg. Co.

MURIATIC ACID
Grasselli Chemical Co., The

NAPKIN FOLDERS
Hudson Sharp Machine Co.
Paper Converting Machine Co.

NAPKIN FOLDING MACHINES
Waldron, John, Corp.

NAPKIN DISPENSERS
Griffith-Hope Co.
International Exposition Co.

OILS AND GREASE
Cook's Sons, Inc., Adam
Shell Petroleum Corporation
Vacuum Oil Co.

OIL BURNERS
Babcock & Wilcox Co.

PACKING
Jenkins Bros.
Graton & Knight Co.
Green Tweed & Co.

PAPER BAG MACHINERY
Coty Machine Co., The
Parrish, A. L.
Potdevin Machine Co.
Smith & Winchester Mfg. Co.

PAPER CUTTERS
Hamblet Machine Co.
Moore & White Co.

Classified Index To Advertisers

Shartle Bros. Machine Co.
Smith & Winchester Mfg. Co.

PAPER DAMPENERS
Perkins & Son, Inc., B. F.

PAPER MANUFACTURERS
Brown Co.
Hammermill Paper Co.
Kalamazoo Vegetable Parchment Co.
Oxford Paper Co.
St. Regis Paper Co.
West Virginia Pulp & Paper Co.

PAPER MACHINE HOODS
Ross Engineering Corp., J. O.

PAPER AND PULP MACHINERY
Appleton Machine Co.
Bagley & Sewall Co.
Baker Manufacturing Corp.
Beloit Iron Works
Biggs Boiler Works, The
Bird Machine Co.
Black-Clawson Co.
Clark-Aiken Co.
Davis, Frank H.
Dayton Beater & Hoist Co.
Dominion Engineering Co.
Downingtown Mfg. Co.
Emerson Manufacturing Co.
Farrel-Birmingham Co.
Glens Falls Machine Co.
Green Bay Foundry & Mch. Works
Lobdell Car Wheel Co.
Lodding Engineering Co.
Manitowoc Eng. Works
Mid-West Machine Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
Paper Mchy. Ltd.
Ryther & Pringle Co.
Shartle Bros. Machine Co.
Smith & Winchester Mfg. Co.
Trimbey Machine Works
Valley Iron Works Co.

PAPER AND PULP MILL SMOKERS
Gibbs-Brower Co.

PAPER SCALES
Foreign Paper Mills, Inc.
Thwing Instrument Co.

PAPER STOCK DEALERS
Leshner Corporation
Mendelson Bros. Paper Stock
Salomon Bros. & Co.

PAPER STOCK WASHERS
Dayton Beater & Hoist Co.
Jones & Sons Co., E. D.

PAPER SCREENS
Shartle Bro. Machine Co.

PAPER TESTERS
Foreign Paper Mills, Inc.
Perkins & Son, Inc., B. F.
Thwing Instrument Co.
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works

PAPER WAXING MACHINERY
Gibbs-Brower Co.
Potdevin Machine Co.
Waldron Corporation, John

PARIS BLACK
Wishnick-Tumpeer, Inc.

PENSTOCKS
Biggs Boiler Wks.
Hunt Machine Co., Rodney
Taylor Forge & Pipe Works

PERFORATING MACHINES
Dietz Machine Works
Waldron, John, Corp.

PERFORATED DRAINERS
Nortmann-Duffke Co.

PERFORATED METAL
Allis Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Mundt & Sons, Charles
Nortmann-Duffke Co.
Wyckoff A., & Son Co.

PIPE CLEANER
Hayton Pump & Blower Co.

PIPE (Steel Riveted & Welded)
Biggs Boiler Works Co.

PIPE (Spiralweld)
Naylor Pipe Co.

PIPE (Steel)
Naylor Pipe Co.
Taylor Forge & Pipe Works

PIPE (Toncan Iron)
Naylor Pipe Co.

PIPE (Wood)
Michigan Pipe Co.

PIPE FITTINGS
Naylor Pipe Co.
Schutte & Koerting Co.
Taylor Forge & Pipe Works
Walworth Company

PIPING
Babcock & Wilcox Co.
Naylor Pipe Co.
Taylor Forge & Pipe Works

PLATERS
Norwood Engineering Co.
Perkins & Son, Inc., B. F.

PLAYING CARD MACHINERY
Waldron, John, Corp.

POWER TRANSMISSION EQUIPMENT
De Laval Steam Turbine Co.
Hunt Machine Co., Rodney

PRECISION INSTRUMENTS
Foreign Paper Mills, Inc.
Thwing Instrument Co.

Presses (Napkin)
Paper Converting Machine Co.

PRESS ROLLS
American Wringer Co., Inc.
Appleton Machine Co., The
Baker Manufacturing Corp.
Emerson Mfg. Co.
Goodrich Rubber Co.
Hunt Machine Co., Rodney
Paper Mchy. Ltd.
Shartle Bros. Machine Co.
Valley Iron Works Co.

PRESSURE BULKERS
Perkins & Son, Inc., B. F.

PRESSURE CONTROL SYSTEMS
Link Belt Co., The
Mason Regulator Co.

PRINTING MACHINES
Hudson Sharp Machine Co.
Waldron, John, Corp.

PULLEYS
Foote Bros. Gear & Machine
Link-Belt Co., The
Murray, D. J. Mfg. Co.
Weller Mfg. Co.

PULP & PAPER MACHINERY
Paper & Textile Mach Co.

PULP & PAPER MILLS CONSULTANTS
Lyden, Frank P.

PULP & PAPER MILLS SPECIALISTS
Lyden, Frank P.

PULPSTONES
Norton Co.
Smallwood Stone Co.

PULP DECKERS
Filtration Engineers, Inc.

PULP GRINDERS
Green Bay Barker Machine & Tool Works
Montague Machine Co.

PULP (KRAFT)
Borregaard Co., Inc., The

PULP SCREENS
Carthage Machine Co.

PULP TESTING
U. S. Testing Co.

PULP THICKENERS
Emerson Mfg. Co.
Filtration Engineers, Inc.
Glens Falls Machine Co.
Moore & White Co.
Oliver United Filters Inc.
Shartle Bros. Machine Co.

PULP WASHERS
Filtration Engineers, Inc.
Goslin, Birmingham Machinery Co.
Oliver Continuous Filter Co.

PUMP PRIMERS (Steam and Water Jet)
Appleton Machine Co., The

The Lindsay Wire Weaving Co.
14025 Aspinwall Avenue, Cleveland, Ohio
Manufacturers of
Lindsay Longcrimp and Spiral Weave Fourdrinier Wires
These wires are making records in large production of paper

USED BY MILLS MAKING OVER 80% OF THE COUNTRY'S PAPER
VACUUM PUMPS
Nash Hytor
AIR COMPRESSORS
NASH ENGINEERING CO. SOUTH NORWALK, CONN.

UNION TALC COMPANY
Finest Grades of Agalite
147 Nassau Street New York

Wood and Tile
TANKS
of every description by your industry's foremost tank builder. Why not call in a specialist?
Kalamazoo Tank & Silo Co.
Kalamazoo Michigan

PAPER TESTS
In Accord with T.A.P.P.I Standard Methods
Oils — Paper — Pulp Water — Microphotograph
Electrical, Mechanical, Physical, Chemical and Photometric Tests
ELECTRICAL TESTING LABORATORIES
80th St. & East End Ave., New York

C.K. WILLIAMS & CO. ANCHOR BRAND DRY COLORS AND FILLERS EASTON, PA. U.S.A.
Red
Brown } Oxides
Yellow
Talc
Yellow Ochres
Umbers, Agalite
C. K. Williams & Company
EASTON, PA.
88 Kent Ave., Brooklyn, N. Y.
1500 Southwestern Ave., Chicago, Ill.

Classified Index To Advertisers

Byron Jackson Co., The
Hayton Pump & Blower Co.
Lawrence Mach. and Pump Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Schutte & Koerting Co.
Valley Iron Works Co.
Warren Steam Pump Co.

PUMPS (Acid)
Baker Manufacturing Corp.
Byron Jackson Co., The
De Laval Steam Turbine Co.
Frederick Iron & Steel Co.
Schutte & Koerting

PUMPS (Acid Centrifugal)
Baker Manufacturing Corp.
Byron Jackson Co., The
De Laval Steam Turbine Co.
Frederick Iron & Steel Co.
Hayton Pump & Blower Co.
Lawrence Mach. & Pump Co.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Oliver United Filters Co.
Schutte & Koerting Co.
Shartle Bros. Machine Co.
Valley Iron Works
Warren Steam Pump Co.

PUMPS (Centrifugal)
Baker Manufacturing Corp.

PUMPS (Boiler Feed)
Allis Chalmers Mfg. Co.
Byron Jackson Co., The
Frederick Iron & Steel Co.

PUMPS (Condensation)
Allis Chalmers Mfg. Co.
Byron Jackson Co., The
Frederick Iron & Steel Co.
Nash Engineering Co.

PUMPS (Rotary Cycloidal)
Baker Manufacturing Corp.
Byron Jackson Co., The
Lawrence Machine Co.

PUMPS (Stuff)
Baker Manufacturing Corp.
Byron Jackson Co.
Emerson Mfg. Co.
De Laval Steam Turbine Co.
Lawrence Mach. & Pump Co.
Frederick Iron & Steel Co.
Moore & White Co.
Morris Machine Works
Nash Engineering Co.
Shartle Bros. Machine Co.
Valley Iron Works Co.
Warren Steam Pump Co.

PUMPS (Stock)
Baker Manufacturing Corp.
Byron Jackson Co., The
Frederick Iron & Steel Co.
Lawrence Mach. and Pump Co.
Morris Machine Works
Shartle Bros. Machine Co.

PUMPS (Suction)
Moore & White Co.
Nash Engineering Co.

PUMPS (Vacuum)
Byron Jackson Co., The
Lawrence Mach. & Pump Co.
Nash Engineering Co., The
Walmsley & Co., (Canada) Limited, Charles
Warren Steam Pump Co.

PYROMETERS (Roll)
Cambridge Instrument Co.
Thwing Instrument Co.

RAG CUTTERS
Clark-Aiken Co.
Perkins & Son, Inc., B. F.
Taylor Stiles & Co.

RECORDING INSTRUMENTS
Bailey Meter Co.
Cambridge Instrument Co.
Thwing Instrument Co.
Westinghouse Electric & Mfg. Co.

RECORDING TACHOMETERS
General Electric Co.
Palmer-Bee Co.

REDUCTION GEARS
Farrel-Birmingham Co., Inc.
Link-Belt Co., The
Philadelphia Gear Works

REELS (Upright & Revolving)
De Laval Steam Turbine Co.
Hunt Machine Co., Rodney
Moore & White Co.

REFINERS (Centrifugal)
Baker Manufacturing Corp.
Bahr Bros.
Bird Machine Co.
Carthage Machine Co.
Hayton Pump & Blower Co.
Manitowoc Eng. Works
Tolhurst Machine Co.

REFINING ENGINES
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Shartle Bros. Machine Co.

REFRACTORIES
Babcock & Wilcox Co.
Lavino, E. J. & Co.
Norton Co.

REGULATIVE VALVES
Mason Regulator Co.
Walmsley & Co., Ltd., Charles

ROD MILL
Allis Chalmers Mfg. Co.
Green Bay Foundry & Mach. Works
Mine & Smelter Co.
Shartle Bros. Machine Co.

ROLL GRINDERS
Dayton Beater & Hoist Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.

ROLLED STEEL FLANGES
Naylor Spiral Pipe Co.

ROLLS (Chilled Iron & Gray Iron)
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Shartle Bros. Machine Co.
Valley Iron Works

ROLLS (Iron, Rubber, Wood)
Baker Manufacturing Corp.
Hunt Machine Co., Rodney

ROLLS (Rubber)
Goodrich Rubber Co.
Hunt Machine Co., Rodney

ROSIN SIZE
General Naval Stores Co., Inc.
Kalbfleisch Corp., The
Paper Makers Chemical Co.

ROTARY BLEACHING BOILERS
Biggs Boiler Works Co.
Manitowoc Eng. Works

ROTARY PULP SCREENS
Montague Machine Co.

ROTARY SCREENS
Bird Machine Co.
Moore & White Co.
Valley Iron Works

ROUND TANKS
Stearns Lumber Co., A. T., The

RUBBER BELTING
Dayton Rubber Mfg. Co.

RUBBER COVERED ROLLS
American Wringer Co.

SAND & POLISHING MACHINES
Waldron, John, Corp.
Hooker Electrochemical Co.
Pennsylvania Salt Co.

SALT CAKE
Grasselli Chemical Co., The

SATURATING MACHINES
Gibbs-Brower Co.
Shartle Bros. Machine Co.
Waldron, John, Corp.

SAVE ALL WIRES
Baker Manufacturing Corp.
Green Bay Wire Works

SAVEALLS
Baker Manufacturing Corp.
Bird Machine Co.
De Laval Steam Turbine Co.
Filtration Engineers, Inc.
Goslin-Birmingham Mfg. Co.
Green Bay Foundry & Mach. Co.
Moore & White Co.
Oliver United Filters Inc.
Shartle Bros. Machine Co.

SAW SHARPENERS
Covel-Hanchett Co.

SCALES
Richardson Scale Co.

SCALES (Automatic Dial)
Kalbfleisch Corporation, The

SCREEN PLATE
Baker Manufacturing Corp.
Green Bay Foundry & Mach. Co.
Hardy & Sons Co., W. A.
Money Paper Mill Supply Co.
Union Screen Plate Co.

SCREENS
Baker Manufacturing Corp.
Beloit Iron Works
Bird Machine Co.
Moore & White Co.
Shartle Bros. Machine Co.
Valley Iron Works

SEMI-STEEL PULLEYS
Jones Foundry & Machine Co., W. A.

SHOWER PIPES
DeZurik Showers Co., The
Emerson Mfg. Co.
Green Bay Foundry & Mach. Co.
Moore & White Mfg. Co.
Roberts Mfg. Co.
Shartle Bros. Machine Co.

SHOWERS (Foam Laying)
DeZurik Shower Co., The

SHREDDERS (Pulp and Paper)
Central Machine Works
Jeffrey Mfg. Co.
Ryther & Pringle Co.
Taylor Stiles & Co.

SILICATE OF SODA
Grasselli Chemical Co., The

SKID-EM-ONS
Central Machine Works

SLASHERS
Murray, D. J., Mfg. Co.
Ryther & Pringle

SLIME REMOVERS
Magnuson Products Co.

SLITTERS AND REWINDERS
Beloit Iron Works
Cameron Machine Co.
Dietz Machine Works
Gibbs-Brower Co.
Langston Co., Samuel M.
Moore & White Co.
Shartle Bros. Machine Co.
Waldron Corporation, John

SLUICE GATES
Dayton Beater & Hoist Co.
Hunt Machine Co., Rodney

SODA ASH
Diamond Alkali Works, Inc.
Grasselli Chemical Co., The
Mathieson Alkali Works, Inc.
Pennsylvania Salt Mfg. Co.
Solvay Process Co.

SODA, SILICATE OF
Philadelphia Quartz Co.

SORTING TABLES
Moore & White Co.

SPANISH OXIDE
Wishnick-Tumpeer, Inc.

SPEED CHANGES (Variable)
Moore & White Co.

SPEED REDUCERS
De Laval Steam Turbine Co.
Foote Bros. Gear & Machine Co.
Link-Belt Co., The
Jones Foundry & Machine Co., W. A.
Nuttall Co., R. D.
Oliver United Filter Corp.
Palmer-Bee Co.
Philadelphia Gear Works

CPEED REDUCERS (Herring Bone)
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Foote Bros. Gear & Machine Co.
Philadelphia Gear Works

SPEED REDUCING GEARS (Double Helical)
De Laval Steam Turbine Co.
Philadelphia Gear Works

SPIRAL BEVEL GEAR DRIVES
Bagley & Sewall Co.

SPIRAL BEVEL GEAR DRIVE STANDS
Moore & White Co.
Philadelphia Gear Works

SPIRAL LOCK-SEAM PIPE
Naylor Pipe Co.
Taylor Forge & Pipe Works

SPIRAL RIVETED PIPE
Taylor Forge & Pipe Works

SPRAYING SYSTEMS
Schutte & Koerting Co.

STACKS AND BREECHINGS
Biggs Boiler Works Co.

STARCH
Corn Products Refining Co.

STAIR TREADS (Non-Slip)
Norton Co.

STAVE PIPE
Stearns Lumber Co., A. T. The

STEAM SEPARATORS
Stickle Steam Specialties Co.
Walworth Co.

STEEL CORES
Fabricated Steel Products Co.

STEAM VALVES
Schutte & Koerting Co.

STEEL (Electric Furnace)
Timken Roller Bearing Co.

STEEL (Open Hearth)
Timken Roller Bearing Co.

STEEL (Stainless)
Jones & Sons Co., E. D.

STEEL PLATE CONSTRUCTION
Biggs Boiler Works Co.
Hendrich Mfg. Co.
Manitowoc Eng. Works

STENCIL PAPER
Patent Papier Fabric Zu Penig.

STEPS (Safety)
Hendrick Mfg. Co.

STOCK CUTTERS
Perkins & Sons, Inc., B. F.

STOCK PUMPS
Frederick Iron & Steel Co.
Hayton Pump & Blower Co.

STOCK REGULATORS
Baker Manufacturing Corp.
Trimbey Machine Co.

STOKERS
American Eng. Co.
Babcock & Wilcox Co.

STUFF CHESTS
Hauser-Stander Tank Co.
Jones & Sons Co., E. D.
Lawrence Mach. and Pump Co.
Mid-West Machine Co.
Moore & White Co.
Shartle Bros. Machine Co.
Stearns Lumber Co., A. T., The
Noble & Wood Machine Co.
Valley Iron Works Co.
Wolford Wood Tank Mfg. Co.

STUFF EJECTORS
Nash Engineering Co.

STUFF PUMPS
Frederick Iron & Steel Co.
Noble & Wood Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works Co.
Warren Steam Pump Co.

STRAW MAKING MACHINERY
Samuel M. Langston Co.

SUCTION BOX COVERS
Baker Manufacturing Corp.
Emerson Mfg. Co.
Moore & White Co.

SUCTION BOXES (Roller)
Norwood Engineering Co.

SULPHITE (Bleached and Unbleached)
Andersen & Co., J.
Borregaard Co., Inc., The
Brown Co., Inc.
Perkins-Goodwin Co.
Parsons Whittemore Co.
Price & Pierce, Ltd.

SULPHUR
Texas Gulf Sulphur Co.

SULPHURIC ACID
Grasselli Chemical Co., The

SULPHUR DICHLORIDE
Hooker Electrochemical Co.

SULPHUR MONOCHLORIDE
Hooker Electrochemical Co.

SULPHUR YL CHLORIDE
Hooker Electrochemical Co.

SULPHUR FURNACES
Schutte & Koerting Co.

SUPERHEATERS (Steam)
Babcock & Wilcox Co.

SYSTEMS (Waste Heat Recovery)
Edge Moor Iron Co.

TABLE ROLLS
American Wringer Co.

TANKS (Acid)
Biggs Boiler Works Co.
Hauser-Stander Tank Co.
Kalamazoo Tank & Silo Co.
Manhattan Rubber Mfg. Co.
Wolford Wood Tank Mfg. Co., G.

TANKS (Agitator)
Biggs Boiler Works Co.
Hauser-Stander Tank Co.
Kalamazoo Tank & Silo Co.
Wolford Wood Tank Mfg. Co., G.

TANKS (Water, Oil, Etc.)
Biggs Boiler Works Co.

Classified Index To Advertisers

Hauser-Stander Tank Co.
Hendrick Mfg. Co.
Kalamazoo Tank & Silo Co.
Wolford Wood Tank Mfg. Co., G.

TANKS (IRON and STEEL)
Baker Manufacturing Corp.
Biggs Boiler Works Co.

TANKS (Wood)
Emerson Mfg. Co.
Hauser-Stander Tank Co.
Hunt Machine Co., Rodney
Kalamazoo Tank & Silo Co.
Shartle Bros. Machine Co.
Wolford Wood Tank Mfg. Co., G.

TELEPHONES
Amer. Tel. & Tel. Co.

TEMPERATURE RECORDERS
Bailey Meter Co.
Cambridge Instrument Co.
General Electric Co.
Thwing Instrument Co.

TENSILE TESTERS
Foreign Paper Mills, Inc.
Perkins & Sons, Inc., B. F.

TESTING LABORATORY
E. I. DuPont De Nemours & Co., Inc.
Electrical Testing Labs.
Little, Inc., Arthur D.
U. S. Testing Co., Inc.

THERMO-COMPRESSORS (Steam Jet)
Schutte & Koerting Co.

THICKENERS
Baker Manufacturing Corp.
Goslin-Birmingham Mfg. Co.
Filtration Engineers, Inc.
Oliver United Filters Inc.
Shartle Bros. Machine Co.
United Filters Corp.

TIMBER ESTIMATES
Sewall, James W.

TOILET ROLL MACHINES
Hudson Sharp Machine Co.

TOILET WINDERS
Dietz Machine Works

TOWEL CABINETS
Griffith-Hope Co.

TOWEL INTERFOLDING MACHINES
Dietz Machine Works

TRACTION CLARIFIER
Dorr Company, The

TRANSMISSION MACHINERY
Dayton Rubber Mfg. Co.
De Laval Steam Turbine Co.
Foote Bros. Gear & Machine Co.
Jeffrey Mfg. Co.
Link-Belt Co., The
Montague Machine Co.
Timken Roller Bearing Co.

TRANSMISSION ROPE
Morey Paper Mill Supply Co.

THREADS (Safety)
Hendrick Mfg. Co.

TRIPLEX PUMPS
Hayton Pump & Blower Co.

TRI-SODIUM PHOSPHATE
Grasselli Chemical Co., The

TRUCK CASTERS
Fairbanks Co.

TRUCK WHEELS
Fairbanks Co.

TRUCKS (Hand)
Fairbanks Co.

TRUCKS
Fairbanks Co.
Ryther & Pringle Co.
Moore & White Co.
Central Machine Works

TRUCKS, SKID-EM-ON
Central Machine Works

TRUCKS (Special Purpose)
Fairbanks Co.

TRUCKS (Wheelbarrow)
Fairbanks Co.

TUBING (Seamless Steel)
Babcock & Wilcox Co.
Timken Roller Bearing Co.

TUBE WELL STRAINERS
Cook, A. D. & Co.

TUBE WELL SUPPLIES
Cook, A. D. & Co.

TUBS (Wood)
Hauser-Stander Tank Co.

TURBO-GENERATORS
De Laval Steam Turbine Co.

TURBINES (Hydraulic)
Smith, S. Morgan
Hunt Machine Works, Rodney

TURBINES (Water)
Cook, A. D. & Co.
De Laval Steam Turbine Co.
Hunt Machine Works, Rodney

TURPENTINE
General Naval Stores

UNIVERSAL GRINDERS
Covel-Hanchett Co.

USED PULP & PAPER MILL MACHINERY
Davis Co., F. H.
Gibbs-Brower Co.
Shartle Bros. Machine Co.

VACUUM PUMPS
Paper & Textile Machy. Co.
Oliver United Filters, Inc.

VALVES
Appleton Machine Co., The
Fairbanks Co.
Green Bay Barker Machine & Tool Works
Hardy & Sons, Wm. A.
Jenkins Bros.
Mason Regulator Co.
Schutte & Koerting Co.
Shartle Bros. Machine Co.
Stickle Steam Specialties
Valley Iron Works Co.
Walworth Company

VALVES—(Ball Check)
Hayton Pump & Blower Co.

VALVES (Blow)
Baker Manufacturing Corp.
Fairbanks Co.

VALVES (Bronze)
Baker Manufacturing Corp.
Schutte & Koerting Co.

VALVES (Gate)
Hayton Pump & Blower Co.

VALVES (Quick Dump)
Baker Manufacturing Corp.
Dayton Beater & Hoist Co.
Mid-West Machine Co.
Shartle Bros. Machine Co.

VALVES (Non-return)
Schutte & Koerting Co.

VALVES (Relief)
Hayton Pump & Blower Co.

VALVES (Reducing)
Schutte & Koerting Co.
Walworth Co.

VALVES (Rubber)
Fairbanks Co.

VALVES (Absorption System)
Ross Engineering Co., J. O.
Stickle Steam Specialties
Walworth Co.

VATS (Wood)
Baker Manufacturing Corp.
Hauser-Stander Tank Co.
Hunt Machine Co., Rodney
Shartle Bros. Machine Co.

WASHER WIRES
Green Bay Wire Works

WASHERS (Endless Felt)
Hunt Machine Co., Rodney

WASHERS
Baker Manufacturing Corp.
Glens Falls Machine Co.

WATER FILTERS
Hungerford & Terry, Inc., The
Norwood Engineering Co.

WATER SOFTENERS
Hungerford & Terry, Inc., The Corp.

WATER TUBE BOILERS
Edge Moor Iron Co.

WATER WALLS
Edge Moor Iron Co.

WATERWHEELS
Hunt Machine Co., Rodney
Smith, S. Morgan

WAXING MACHINERY
Waldron, John, Corp.

WEIGHING SCALES
Richardson Scale Co.

WET MACHINES
Baker Manufacturing Corp.
Emerson Mfg. Co.
Glens Falls Machine Co.
Shartle Bros. Machine Co.
Valley Iron Works

WHITE WATER SAMPLER
DeZurik Shower Co., The

WINDERS
Cameron Machine Co.
Langston Co., Sam L.
Moore & White Co.
Shartle Bros. Machine Co.

WIRE GUIDE ROLLS
American Wringer Co.

WIRE GUIDES
Moore & White Co.

WIRE STRETCH ROLLS
American Wringer Co.

WOOD SPLITTERS
Carthage Machine Co.

WOOD BURNING FURNACE
Combustion Engineering Corp.

WOOD WASHERS
Carthage Machine Co.

WORMED CUTTERS
American Wringer Co.

LOCKWOOD'S DIRECTORY

OF THE PAPER AND ALLIED TRADES

1930 EDITION

CORRECTED UP-TO-DATE

CONTENTS

Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

City Addresses of Mills and Mill Supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufactuters
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
Paper Bag Manufacturers
Paper Box Manufacturers
Paper, Wood Pulp and Chemical Fiber Mills of the United States, Canada, Cuba, Mexico and South America
Paper Specialties Manufacturers
Papeterie Manufacturers
Prepared Roofing Manufacturers
Rags and Paper Stock Consumed by the Paper Mills
Stationers in United States, Porto Rico, Canada, Cuba, Hawaiian Islands and the Philippine Islands
Statistical Table of Mills
Tablet Manufacturers
Tag Manufacturers
Toilet Paper Manufacturers
Trade Associations
Twine Manufacturers
Vegetable Parchment Manufacturers
Wall Paper Printers
Water Marks and Brands
Waxed Paper Manufacturers

1,000 PAGES
***of* USEFUL INFORMATION**

Traveler's Special Pocket Edition

bound in a flexible cover for use of traveling men, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order).

Published by
LOCKWOOD TRADE JOURNAL CO.
10 East 39th Street
New York, N. Y., U.S.A.

1864 1930

"EXCELSIOR" FELTS

for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America.

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

SOLD BY

BULKLEY, DUNTON & COMPANY
75-77 Duane St., N. Y., and direct

Prompt deliveries made from stocks in
NEW YORK
BOSTON
PHILADELPHIA
CHICAGO

TRADE U MARK

The Buyer Who Doesn't Worry—

is the buyer who can trust his source.

For more than sixty years, Heller & Merz have been delivering qualily dyestuffs with unfailing service.

An order on Heller & Merz means the positive assurance of delivery . . . as and when ordered.

HELLER & MERZ CORPORATION

505 Hudson St., New York

Boston
287 Atlantic Ave

Chicago
146 W. Kinzie St.

Philadelphia
South St. & Delaware Ave.

Springfield, Mass.
40 Albert St.

Factory—NEWARK, N. J.

INDEX TO ADVERTISERS

A

	Page
Acer McLernon & Co., Ltd.	—
Air Preheater Corporation	—
Albany Felt Co.	—
Allis-Chalmers Mfg. Co.	—
American Appraisal Co., The	—
American Engineering Co.	—
American Lurgi Corp.	—
American Manganese Bronze Co.	—
American Pulp & Paper Mill Supt. Ass'n.	—
American Tel. & Tel. Co.	—
American Voith Contact Co.	—
American Wringer Co., Inc.	75
Andersen & Co., J.	86
Appleton Machine Co.	—
Appleton Wire Works	69
Appleton Woolen Mills	69
Armstrong Cork & Insulation Co.	—
Arnold Hoffman & Co.	65
Atterbury Bros., Inc	—
Austin Co.	Back Cover

B

Babcock & Wilcox Co.	85
Badenhausen Corporation	—
Bagley & Sewall Co.	41
Bahr Bros. Mfg. Co.	—
Bailey Meter Co.	69
Baker Corporation	—
Beloit Iron Works	Front Cover
Biggs Boiler Works	71
Bird Machine Co.	27
Black-Clawson Co.	35, 36
Blaw-Knox Co.	—
Bolton & Sons, Inc., John W.	—
Borregaard Co., The	77
Bowsher & Co., N. P.	67
Box Crane & Hoist Corp.	—
Bradley Mfg. Co., A. J.	—
Brown Co.	—
Buffalo Steam Pump Co.	—
Bulkley, Dunton & Co.	84
Butterworth & Sons Co., H. W.	—

C

Caldwell & Sons Co., H. W.	—
Cambridge Instrument Co.	—
Cameron Machine Co.	4
Carey, James L.	—
Carthage Machine Co.	—
Castle & Overton, Inc.	—
Central Alloy Steel Corp.	—
Central Machine Works	69
Centrifugal Engineers and Patent Corp.	—
Chemipulp Process, Inc.	—
Cities Service Oil Co.	—
Clark-Aiken Co.	—
Clinton Corn Syrup Refining Co.	—
Coe Mfg. Co.	—
Consolidated Products Co.	74
Continental Industrial Eng., Inc.	67
Cook's Sons, Inc., Adam	—
Corn Products Ref. Co.	—
Covel-Hanchett Co.	—
Cutler-Hammer Manufacturing Co.	—

D

Davis Co., Frank H.	74
Dayton Beater & Hoist Co.	65
Dayton Rubber Mfg. Co., The	—
De Laval Steam Turbine Co.	4
DeZurik Shower Co., The	—
Diamond Alkali Co.	—
Dietz Machine Works	—
Dilts Machine Works	33
Dominion Engineering Works	—
Dorr Co., The	—
Downingtown Mfg. Co.	29
Draper Bros. Co.	80
Du Pont de Nemours & Co., E. I.	—

E

Eastern Chain Works, Inc.	—
Eastwood Wire Corp.	71
Edgar Bros., Inc.	71
Edge Moor Iron Co.	—
Electrical Testing Laboratories	81
Electro Bleaching Gas Co.	18
Elixman Paper Core Co.	78
Elwell-Parker Electric Co.	—
Emerson Mfg. Co.	—
English China Clay Sales, Inc.	—

F

Fabricated Steel Products Co.	69
Fairbanks Co.	—
Farrel-Birmingham Co.	63
Ferguson Co., H. K.	—
Ferguson & Co., Hardy S.	65
Fiber-Making Process, Inc.	—
Fidalgo-Drying Systems, Inc.	10
Fifth Avenue Bldg., The	—
Filtration Engineers, Inc.	—
Fisher Governor Co.	7
Fitchburg Duck Mills	—
Flather Machine Co.	—
Flexible Steel Lacing Co.	—
Foreign Paper Mills, Inc.	—
Foote Bros. Gear & Mach., Inc.	—
Fraser Paper, Ltd.	—
Frederick Iron & Steel Co.	76
Freeman & Co., Samuel	—

G

Gears & Forgings, Inc.	—
General Chemical Co.	—
General Dyestuffs Corp.	—
General Electric Co.	—
General Naval Stores Co.	—
Gibbs-Brower Co., Inc.	—
Goodrick Rubber Co., The B. F.	—
Goodyear Tire & Rubber Co.	—
Goslin-Birmingham Mfg. Co.	6
Gotteman & Co., M.	—
Grasselli Chemical Co., The	—
Graton & Knight Co.	3
Green Bay Barker Machine & Tool Works	—
Green Bay Wire Works, Inc.	—
Green Tweed & Co	—
Griffith Hope Co.	—
Gross Paper Co., Inc.	75

H

Hamblet Machine Co.	85
Hammermill Paper Co.	87
Harbaugh Process Co.	69
Hardy, George F.	65
Hardy & Sons Co., W. A.	—
Harrington & King Perforating Co.	63
Harris Seybold Potter Co.	—
Hartzell Propeller Fan Co.	—
Hauser-Stander Tank Co.	—
Hayton Pump & Blower Co.	76
Healy-Ruff Company	—
Heinrich, H. H., Inc.	—
Heller & Merz Corp.	84
Hendrick Mfg. Co.	69
Hicks, Daniel M.	—
Hooker Electrochemical Co.	2
Huber, J. M., Inc.	—
Hungerford & Terry, Inc.	—
Hunt Machine Co., Rodney	—
Hurst, Adolphe E., & Co.	—
Huyck & Sons, F. C.	—
Hyatt Roller Bearing Co.	—

I

International Pulp Co.	—
International Wire Works	69

J

Jackson Co., Byron	15
Jeffrey Mfg. Co.	—
Jenkins Bros.	—
Jenssen Co., G. D.	14
Johns-Manville Corp.	—
Johnson & Wierk, Inc.	69
Jones & Sons Co., E. D.	75
Jones, W. A. Foundry & Machine Co.	—

INDEX TO ADVERTISERS

K

Page
Kalamazoo Tank and Silo Co. 8
Kalamazoo Vegetable Parchment Co. 10
Kalbfleisch Corporation .. —
Kellogg Co., M. W. 71
Key Boiler Equipment Co. —
Knox Woolen Co. 84

L

Land O'Lakes Creameries, Inc. ..... —
Langston Co., Samuel M. —
LaSalle Extension University ..... —
Lavino, E. J., & Co. ..... —
Lawrence Machine & Pump Co. 67
Leshner Corp. ..... —
Lefren, Inc., Karl A. 69
Lennig & Co., Inc., Charles 14
Lindsay Wire Weaving Co. 81
Link-Belt Co. ..... —
Little, Arthur D. 69
Lobdell Car Wheel Co. .... —
Lockwood's Directory 45
Loomis Talc Corp., W. H. —
Lyden, Frank P. ..... —

M

Madden Corp., Jay, The . —
Magnuson Products Corp. —
Manitowoc Eng. Works .. —
Mason Regulator Co. .... —
Mathieson Alkali Works 48
Meincke & Son, A. M. .... —
Merrimac Chemical Co. .. 75
Mendelson Brothers Paper Stock Co. 67
Michigan Pipe Co. ..... —
Mid-West Machine Co. .. 69
Mine & Smelter Supply Co. ..... —
Minton Vacuum Dryer Corp. ..... —
Monarch Metal Co. ..... —
Montague Machine Co. ... 16
Moore & White Co. 39
Morey & Co. ..... —
Morris Machine Works .. —
Mundt & Son, Charles 65
Murray Mfg. Co., D. J. .. —

N

Nash Engineering Co. ... 81
National Anilene & Chemical Co. 11
Neumeyer & Dimond .... —
Noble & Wood Machine Co. —
Norma Hoffman Bearings Co. ..... —
Nortmann-Duffke Co .... —
Norton Co., The ..... —
Norwood Engineering Co. —

O

Oakite Products, Inc. .... —
Ohio Cultivator Co. ..... —
Oliver United Filters Inc. 75
Orbison & Orbison ..... —
Orr Felt & Blanket Co. .. —
Oxford Paper Co. ..... —

P

Pagel-Horton & Co. ..... —
Palmer-Bee Company .... —
Paper Converting Machinery Co. ..... —
Paper Makers Chemical Corp. 79
Paper & Textile Machinery Co. ..... —
Paper Roll Plug Co. .... —
Parsons & Whittemore, Inc. ..... —
Paten Papier Fabrik Zu Penig ..... —
Pennsylvania Salt Mfg. Co. ..... —
Penberthy Injector Co. .. —
Perkins & Sons, Inc., B. F. 15
Perkins Goodwin Co. .... —
Philadelphia Gear Works —
Philadelphia Quartz Co. .. —
Pickles, W. F. 63
Potdevin Machine Co. 79
Powell, Wm. Co., The .... —

Page
Price & Pierce, Ltd. 77
Pulp Bleaching Corp. .... —
Pulp & Paper Mills Supply —
Pulp & Paper Trading Co. 86
Pusey and Jones Corp. .. 2

R

Rhoads & Sons, J. E. .... —
Richardson Scale Co. .... —
Riegel Paper Corp. ..... —
Roberts Manufacturing Co., F. W. 79
Rogers, Samuel C. & Co. —
Ross Engineering Corporation, J. C. 69
Roessler & Hasslacher Chemical Co., The .... —
Ryther & Pringle Co. 69

S

Schutte & Koerting Co. .. —
Scovell, Wellington & Co. 65
Sewall, James W. 69
Shartle Bros Mach. Co. .35, 36
Shell Petroleum Co. ..... —
Shenango-Penn Mold Co. —
Shuler & Benninghofen .. —
Simons, V. D. ..... —
S. K. F. Industries ..... —
Smallwood Stone Co., The —
Smidth, F. L. & Co. ..... —
Smith, Frederick L. 69
Smith Co., S. Morgan .... —
Smith & Winchester Manufacturing Co. 16
Solvay Sales Corp. 6
Standard Oil Company (Indiana) ..... —
Stearns Lumber Co. ..... —
Stebbins Engr. & Mfg. Co. 75
Stewart, Paul & Co. ..... —
Stickel Steam Specialty Co. ..... —
St. Regis Paper Co. 76
Stratton Engineering Corp. —

T

Taylor Forge & Pipe Works 67
Taylor, H. S. 65
Taylor Instrument Co. .. —
Taylor Stiles & Co. 65
Technical Economist Corporation ..... —
Terry Steam Turbine Co. —
Texas Co. ..... —
Texas Gulf Sulphur Co. .. 80
Textile Finishing Machinery Corp. ..... —
Ticonderoga Machine Wks. —
Thwing Instrument Co. .. —
Timken Roller Bearing Co. —
Tolhurst Machine Works . —
Trimbey Machine Works. 67
Turner Halsey Co. ..... —
Tyler, W. S., Co., The 17

U

Union Screen Plate Co. .. —
Union Talc Co. 81
U. S. Testing Co. ..... —

V

Vacuum Oil Co. 8, 9
Valley Iron Works Co. 31, 43
Vanderbilt Co., R. T. .... —
Vertical Hydrator Co. .... —

W

Waldron Corp., John 65
Walmsley, Chas. Co. .... —
Walworth Co. 5
Warren Steam Pump Co. —
Waterbury Felt Co. 77
Waterbury Tool Co. ..... —
West Virginia Pulp & Paper Co. 78
Westinghouse Electric & Mfg. Co. 12, 13
Williams & Co., C. K. 81
Williams Apparatus Co. .. —
Wichnick-Tumpeer, Inc. .. —
Woolford Wood Tank Mfg. Co., G. 63
Wyckoff & Sons Co., A. .. —

The Babcock & Wilcox Co.

85 LIBERTY STREET, NEW YORK

ESTABLISHED 1868

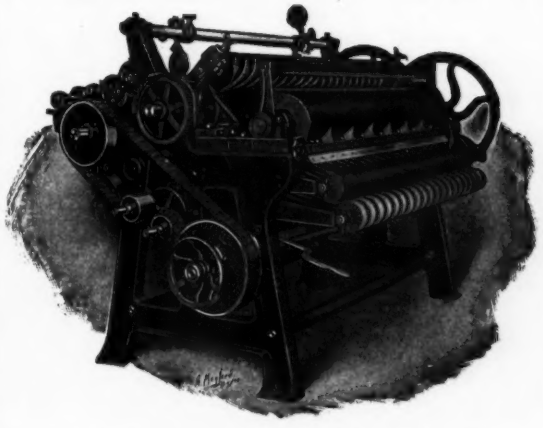
Water Tube Boilers — Steam Superheaters
Economizers — Air Preheaters
Chain Grate Stokers — Oil Burners
Refractories
Seamless Tubes and Seamless Pipe

BRANCH OFFICES

ATLANTA	Candler Building
BOSTON	80 Federal Street
CHICAGO	20 North Wacker Drive
CINCINNATI	Traction Building
CLEVELAND	Guardian Building
DALLAS, TEXAS	Magnolia Building
DENVER	444 Seventeenth Street
DETROIT	Ford Building
HOUSTON, TEXAS	Electric Building
LOS ANGELES	Central Building
NEW ORLEANS	344 Camp Street
PHILADELPHIA	Packard Building
PHOENIX, ARIZ.	Lubr's Tower
PITTSBURGH	Koppers Building
PORTLAND, ORE.	Failing Building
SALT LAKE CITY	Kearns Building
SAN FRANCISCO	Sheldon Building
SEATTLE	L. C. Smith Building
HONOLULU, T. H.	Castle & Cooke Building
HAVANA, CUBA	Calle de Aguiar 104
SAN JUAN, P. R.	Recinto Sur 45

Paper Cutters

Single, Duplex and Diagonal



Cutter Knives — Patent Top Slitter

HAMBLET MACHINE CO.

LAWRENCE, MASS.

CHEMICAL AND MECHANICAL PULP

BLEACHED SULPHITE

Kellner-Partington Paper Pulp Co. Ltd.
Sarpsborg, Norway—Edsvalla, Sweden
Hallein and Villach, Austria

UNBLEACHED SULPHITE

Cellulosefabriks A.—G., Bratislava, Cecho-Slovakei
Bergvik och Ala Nya Aktiebolag, Söderhamm, Sweden
Svanö Aktiebolag, Svanö, Sweden
Aktieselskabet Greaker Cellulosefabrik, Greaker Norway

KRAFT PULP

Nensjö Cellulosa A.—B., Sprängsviken, Sweden
Bergvik och Ala Nya Aktiebolag, Söderhamm, Sweden
Munksunds Aktiebolag, Munksund, Sweden
Kalix Träindustri Aktiebolag,
Vanafjärden, Sweden

Selling Agents

J. ANDERSEN & CO.

21 EAST 40th STREET NEW YORK

WAYAGAMACK KRAFT PULP

CANADIAN KRAFT LTD.

THREE RIVERS, CANADA

Sulphite Pulp—Paper and Board
J. & J. Rogers Co.,
Ausable Forks, N. Y.

Bleached Sulphite — Bleached Soda Pulp
Howard Smith Paper Mills, Ltd.
Cornwall, Ont., Canada

Selling Agents

THE PULP & PAPER TRADING CO.

21 EAST 40th STREET, NEW YORK CITY